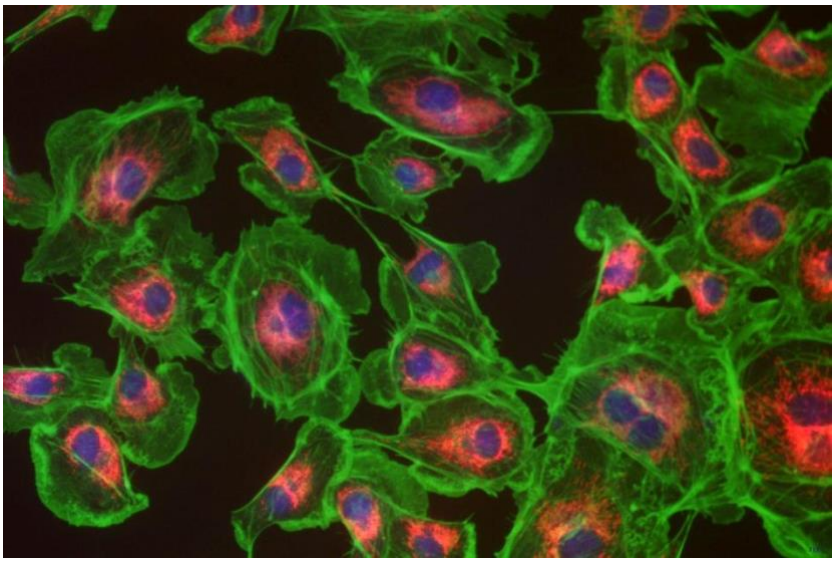
ToupTek USB Microscope Camera Catalog

ToupTek Temperature Regulated USB3.0 CMOS Camera



Fluorescent Image Captured by ToupCam Camera

Nov. 01, 2023

Product Catalog

1 Update History

2 Introduction to ToupCam Microscope USB Camera

2.1 About ToupTek Photonics

ToupTek is a manufacturer of machine vision products with image and video as its focus. We concentrate on the development of microscopic cameras, astronomical cameras and machine vision cameras. ToupTek is a witness, practitioner and pusher of global machine vision industry.

ToupTek cameras has the largest market share in the microscope camera industry across the world. Our customers include but not limit to the following:

- North America: United States, Canada, Mexico;
- South America: Colombia, Brazil, Argentina;
- Africa: Morocco, Egypt, South Africa;
- Europe: United Kingdom, Ukraine, Switzerland, Sweden, Spain, Serbia, Norway, Russia, Poland, Netherlands, Moldova, Italy, Hungary, Germany, France, Finland, Denmark, Czech Republic, Bulgaria, Belgium, Austria, Turkey;
- Asia: China, Hong Kong, Taiwan, Thailand, Vietnam, Singapore, Philippines, South Korea, Japan, Malaysia, Indonesia, India, Israel, Iran;
- Oceania: Australia, Nauru, New Zealand worldwide.

ToupTek R&D personnel accounts for 30% of the company's total staff and includes nearly 5 Ph.D.s, 20 masters, and 4 engineers with oversea experience. It is a high-tech company driven by technology and market.

ToupTek adheres to the company motto: “Concentration, Focus, Diligence and Innovation” and implements the strategy of “Where there is eye, there is ToupTek camera; where there is image sensing, there is ToupTek camera”. The mission is to develop video technology to better serve humanity and the future.

2.2 Microscope USB Camera

ToupTek microscope USB cameras are the best digital cameras for use in any laboratory setting. ToupTek microscope USB cameras let you capture, edit and share high-quality images with your microscope equipment.

For microscope USB cameras, a high-quality microscope adapter is the key to ensure superior digital images from the microscope. ToupTek® has designed numerous adapters that fits microscope phototube, microscope trinocular tube or eyepiece port. The adapters fit the four well-known brands including Zeiss, Nikon, Leica and Olympus and the other famous Chinese microscope manufacturer.

ToupTek microscope USB cameras and its software together offer users standardized and high-quality image capturing, live video streaming and photo editing functions.

For any customer who wants to convert a traditional microscope into a digital one, ToupTek® helps the user to choose and to integrate the best microscope USB camera based on the user's requirements.

ToupTek's mission is to help every user, hobbyists and professionals, capture high-quality microscopic images so that everyone would benefit from ToupTek products.

2.3 Product Nomenclature

	UHCCD	05100K	P	A	-U	-ET	-S	-C	-SQ	-NA
	1	2	3	4	5	6	7	8	9	10
1	Series Name: MTR3CCD, U3CCD, EXCCD, UHCCD, MTR3CMOS, MAX, BigEye E3ISPM,E3CMOS, U3ISPM, L3CMOS, U3CMOS, C3CMOS, S3CMOS, ECMOS LCMOS, UA, UCMOS SPCMOS, SCMOS, HCAM									
2	Pixel Number: eg. 05100K: 5.1 Mega pixels									
3	Color Mode, M: Monochromatic; P: Polychromatic									
4	Sensor Distinguishing Code, such as A, B, C or D…									
5	Data Output Interface Model, U: USB; D: DVI; V: VGA; A: Analog									
6	Trigger Type, ET: External Trigger; NA: Not Available									
7	Cooled Type, S: Semiconductor Cooled; F: Fan Cooled; N: Natural Cooled									
8	Optical-Mechanical Interface Type, C: C-mount; M: Microscope; T: Telescope; S: Sporting Scope									
9	Mechanical Shape , CY: Cylinder; SQ: Square; CP: Compact									
10	TV System (Analog Cameras Only), PA: PAL; NT: NTSC; NA: Not Available									

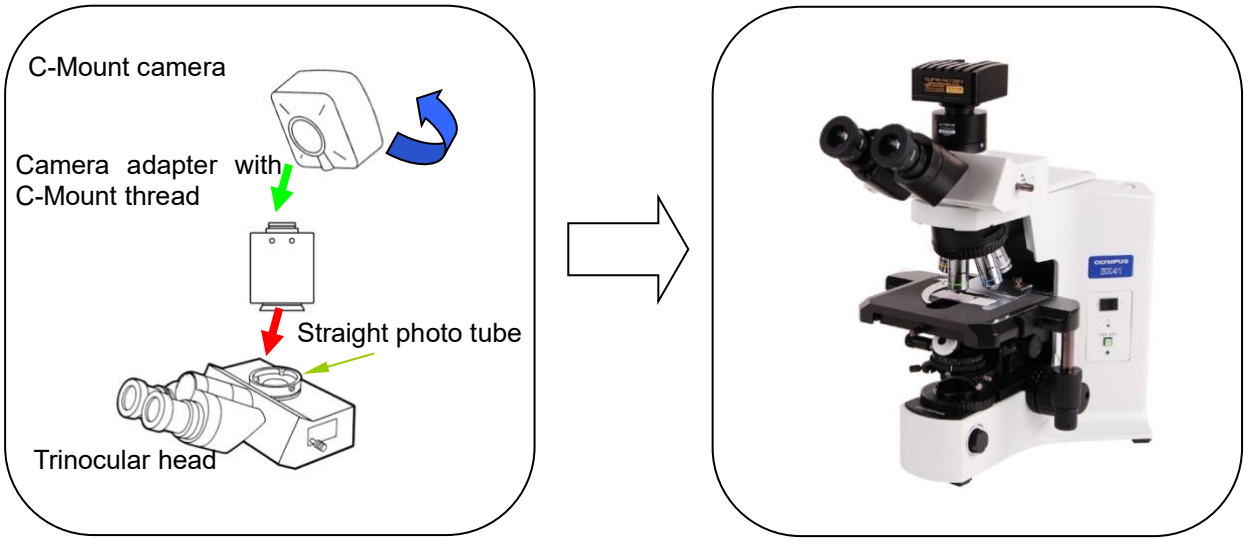
2.4 Comparison of ToupCam Microscope USB Cameras

Model	Interface	Characteristic
MTR3CCD	USB3.0	Temperature-regulated **USB3.0** CCD camera with **Sony** Super HAD/ExView CCD sensor. Controllable fan is used to achieve high performance heat radiation. Up to 50 degrees temperature drop ensures high quality video or image with lower noise;
U3CCD	USB3.0	USB3.0 CCD camera with **Sony** Super HAD/ExView CCD sensor. USB3.0 ensures high speed data transfer rate.
EXCCD	USB2.0	High Speed CCD camera with **Sony** ExView HAD CCD sensor. It could be used for dark field applications due to its high sensitivity, such as fluorescence applications;
UHCCD	USB2.0	High Speed CCD camera with **Sony** Super HAD CCD sensor;
LHCCD	USB2.0	Linear USB2.0 CCD camera with C-mount, f-mount, and **M72x0.75** photography standards
MTR3CMOS	USB3.0	Temperature-regulated **USB3.0** CMOS camera with **Sony** Exmor, Exmor R and Exmor RS CMOS sensor as the image-picking device. This technique could lower the sensor noise and upgrade the CMOS sensor to the CCD sensor image quality
MAX	USB3.0	Temperature-regulated **USB3.0** CMOS camera with SONY Exmor **full-frame** or GSENSE **large pixels** sensor, USB 3.0 is used as the data transfer interface. This technique could lower the sensor noise and upgrade the CMOS sensor to the CCD sensor image quality
BigEye	USB3.0	
E3ISPM	USB3.0	
E3CMOS	USB3.0	Super speed **USB3.0** camera with **Sony** Exmor or Exmor R CMOS Sensor. The most cost-effective USB3.0 imaging solution;
U3ISPM	USB3.0	
L3CMOS	USB3.0	Super speed **USB3.0** camera with on-board memory for **Aptina** and **Sony** CMOS Sensor; High performance cooling structure ensures low image noise;
U3CMOS	USB3.0	Super speed USB3.0 camera with **Aptina** CMOS Sensor The most cost-effective USB3.0 imaging solution;
C3CMOS	USB3.0	
S3CMOS	USb3.0	Compact microscope eyepiece camera with 23.2 diameter and **Aptina** CMOS sensor and USB3.0 interface;
ECMOS	USB2.0	
LCMOS	USB2.0	High speed USB2.0 camera with on-board memory for **Aptina** and **Sony** CMOS Sensor; On-board memory helps the camera to achieve the bandwidth limitation of USB2.0 and make the camera work stable for different computers with different configuration. High performance cooling structure ensures low image noise;
UA	USB2.0	
UCMOS	USB2.0	High speed USB2.0 camera with **Aptina** CMOS sensor; The most cost-effective USB2.0 imaging solution;
SPCMOS	USB2.0	Microscope economic eyepiece camera with embedded reduction lens to enlarge the FOV. The 23.2mm diameter ensures is can be directly insert into the eyepiece tube
SCMOS	USB2.0	Microscope economic eyepiece camera with 23.2mm diameter. Aptina sensor is used as the image pickup device;
XCAM	HDMI/VGA	HDMI & VGA output camera; DSP inside ensuring high image quality and versatile functions; Including automatic white balance and exposure on/off (AEWB), saving images to SD card (SAVE), video stream and freeze on/off (FREEZE), multiple groups of cross lines and remote image snapshot controller to reduce the vibration blur (REMOTE);
WCAM	WiFi	WiFi cameras. H.264 or MJPEG compression ensures high quality video; WiFi-enabled devices could be used to receive the video, such as smartphones, computers, and tablets with iOS, Android, and Windows operating systems; Multiple users could have access to one camera simultaneously(up to 10); Born with ToupView imaging software for quantifying, measuring, and annotating images which is downloadable from app store viewing, capturing, and editing images(Windows OS only);
WUCAM	WiFi+USB	Multiple data output method(USB+WiFi) with switch on the cover;
HDMI720P	HDMI	HDMI camera with720P hardware resolution
XCAM	HDMI+USB; HDMI+WiFi	With HDMI+USB+SD card output interface. GUI is supported to make the adjustment at ease With HDMI+WiFi+SD card output interface. GUI is supported to make the adjustment at ease
ICMOS	USB2.0	USB2.0 industrial camera with on-board memory for perfect synchronization and stable performance; 8-pin Hirose HR25-7TR-8PA GPIO connector for optical coupler isolation trigger, strobe (Optional); Compact industrial standard size (29x29x29 mm)for easy integration;
HCAM	USB2.0	Handheld USB2.0 microscope with 10X to 1300X magnification;

3 ToupCam® Camera & Microscope Configuration

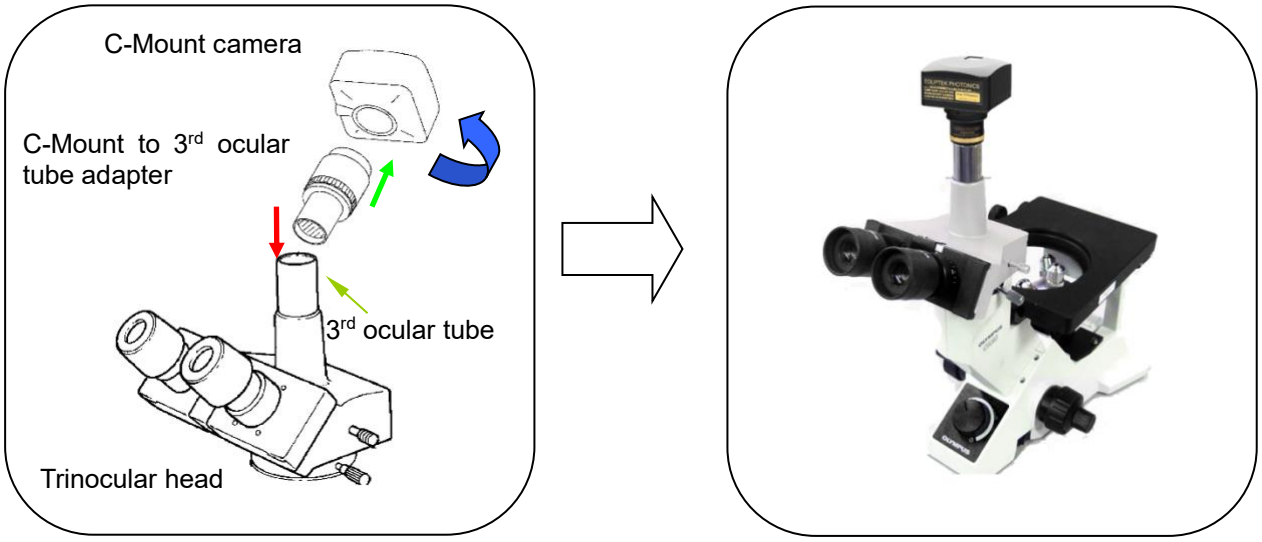
3.1 Trinocular Digital Microscope (1/2)

Attach the C-mount camera and Adapter to the straight photo tube



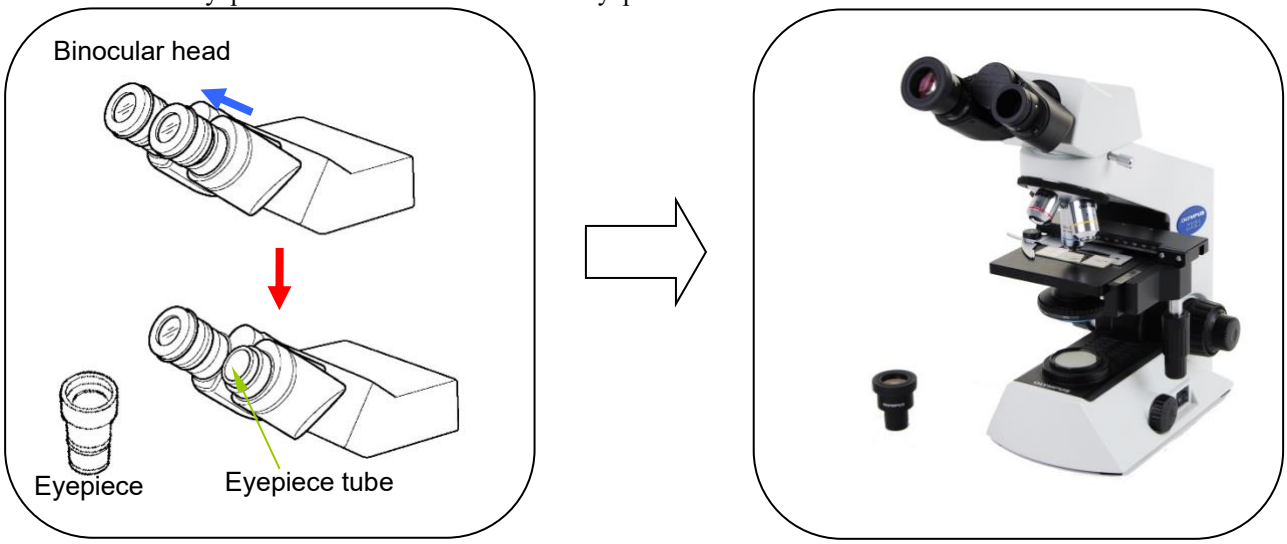
3.2 Trinocular Digital Microscope (2/2)

Attach the C-Mount camera and adapter to the 3rd ocular tube or the other 2 eyepiece tubes

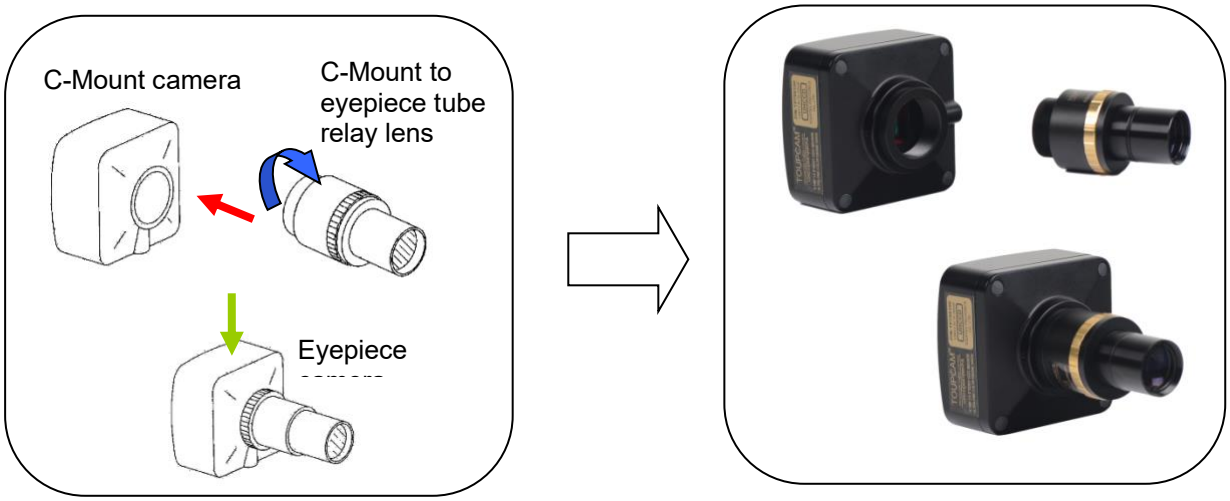


3.3 Binocular Digital Microscope

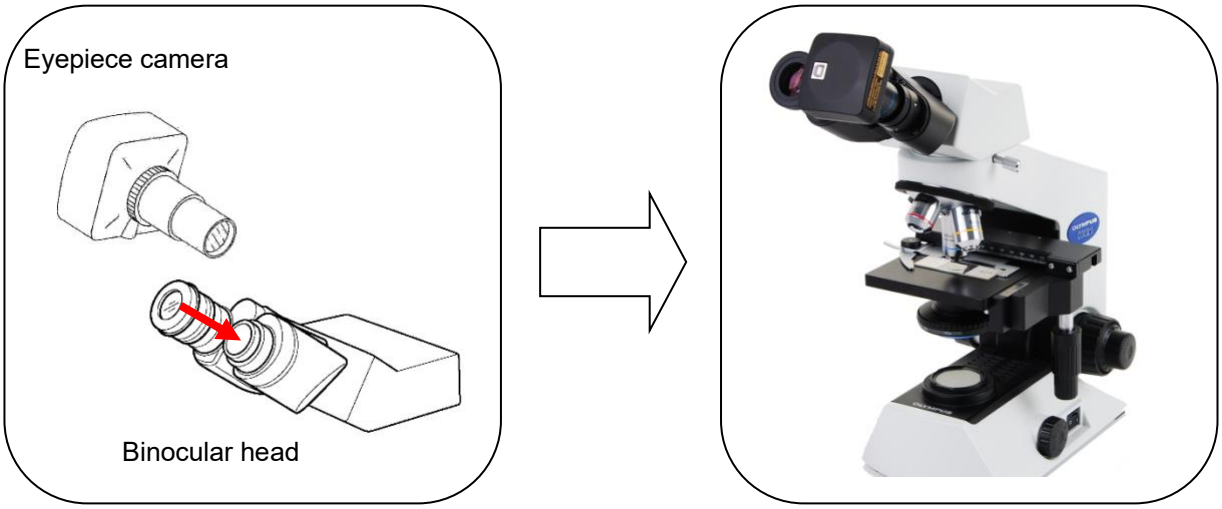
STEP 1: Remove the eyepiece from the ocular tube or the eyepiece tube



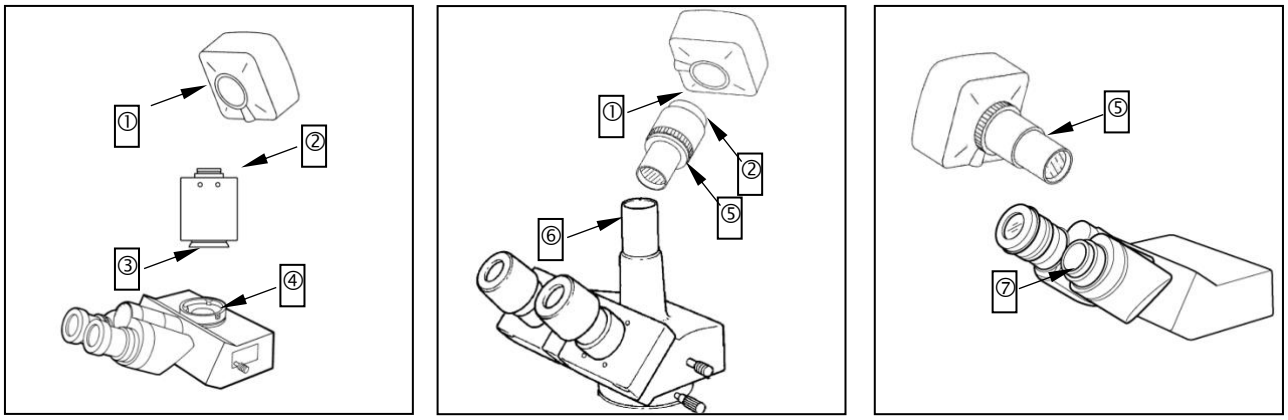
STEP 2: Attach (Screw) the camera adapter to the C-mount camera



STEP 3: Attach (Insert) the eyepiece camera into the ocular tube or eyepiece tube



3.4 Size Description of the Connection Parts



① Standard C-Mount: Dia.1 inch (25.4mm) female thread
② Standard C-Mount: Dia.1 inch (25.4mm) male thread
③ Camera Adapter connector: size varies between microscope brands
④ Straight photo tube: size varies between microscope brands
⑤ Relay lens: standard eyepiece connector size, Dia.23.2mm (male)
⑥ 3rd ocular tube: standard eyepiece connector size, Dia.23.2mm (female)
⑦ Ocular tube: standard eyepiece connector size, Dia.23.2mm (female)

4 Microscope TE-Cooling USB 3.0 CCD Camera

4.1 MTR3CCD Series TE-Cooling USB3.0 C-mount CCD Camera(12)

4.1.1 The Basic Characteristic of MTR3CCD Series

MTR3CCD series camera adopts Sony Exview HAD CCD II sensor as the image-picking device with two-stage peltier cooling sensor chip to -40 degree below ambient temperature. This will greatly increase the signal to noise ratio and decrease the image noise. Smart structure is designed to ensure the heat radiation efficiency and avoid the moisture problem. Electric fan is used to increase the heat radiation speed.

USB3.0 is used as the data transfer interface to increase the frame rate.

MTR3CCD series comes with advanced video & image processing application ToupView/ToupLite Providing Windows/Linux/OSX multiple platform SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

The MTR3CCD series can be widely used in low light environment and microscope fluorescence image capture and analysis, as well as the astronomy deep sky application.

The basic characteristic of MTR3CCD series can be summarized as follows:

- Standard C-Mount camera with SONY ExView HAD CCD II sensors from 1.4M to 12M;
- Two-stage TE-cooling with controllable electric fan;
- Sensor chip cooling up to 40°C below ambient temperature;
- Working temperature can be regulated to specified temperature in 5 minutes;
- Smart structure to assure the heat radiation efficiency and avoid the moisture problem;
- IR-CUT/AR coated windows;
- Up to 1-hour long time exposure;
- USB3.0 5Gbit/second interface ensuring high speed data transmission;
- Ultra-Fine color engine with perfect color reproduction capability;
- With advanced video & image processing application ToupView or ToupLite;
- Support both video and trigger modes;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain control API;

4.1.2 MTR3CCD Series Datasheet(12)

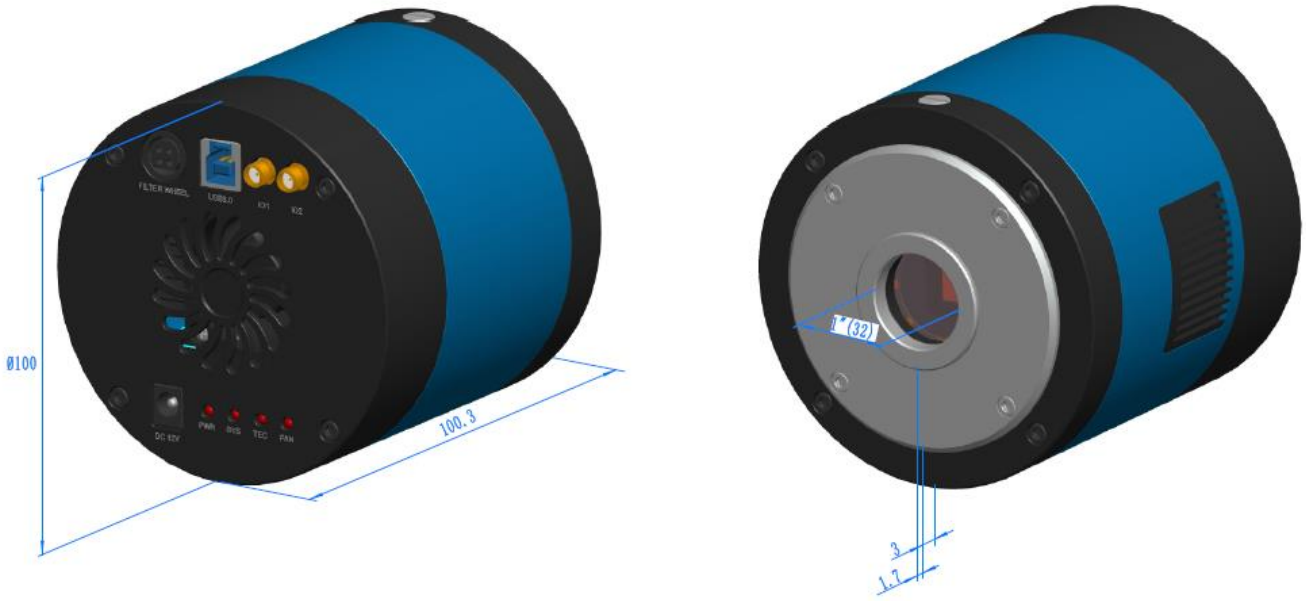
Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution	Binning	Exposure
MTR3CCD12000KPA MP112000A(New)	12M/ICX834AQG(C) 1“ (13.15x8.77)	3.1x3.1	420mv with 1/30s 15.2mv with 1/30s	3.6@4248x2836 3.6@2124x1418	1x1 2x2	0.06ms~1h
MTR3CCD12000KMA MM112000A(New)	12M/ICX834ALG(M) 1“ (13.15x8.77)	3.1x3.1	420mv with 1/30s 12mv with 1/30s(F8.0)	3.6@4248x2836 3.6@2124x1418	1x1 2x2	0.06ms~1h
MTR3CCD09000KPA MP109000A(New)	9.0M/ICX814AQG(C) 1“ (12.47x9.98)	3.69x3.69	580mv with 1/30s 12mv with 1/30s	4.4@3388x2712 4.4@1694x1356	1x1 2x2	0.06ms~1h
MTR3CCD09000KMA MM109000A(New)	9.0M/ICX814ALG(M) 1“ (12.47x9.98)	3.69x3.69	660mv with 1/30s 12mv with 1/30s(F8.0)	4.4@3388x2712 4.4@1694x1356	1x1 2x2	0.06ms~1h
MTR3CCD06000KPA MP106000A	6.0M/ICX695AQG(C) 1“ (12.48x9.99)	4.54x4.54	880mv with 1/30s 8mv with 1/30s	7.5@2748x2200 14@2748x1092	1x1 1x1	0.06ms~1h
MTR3CCD06000KMA MM106000A	6.0M/ICX695ALG(M) 1“ (12.48x9.99)	4.54x4.54	1000mv with 1/30s 8mv with 1/30s	7.5@2748x2200 14@2748x1092	1x1 1x1	0.06ms~1h
MTR3CCD02800KPA MP102800A(New)	2.8M/ICX674AQG(C) 2/3“ (8.81x6.63)	4.54x4.54	800mv with 1/30s 4mv with 1/30s	15@1938x1460 17@1610x1212 18@1930x1092	1x1 1x1 1x1	0.05ms~1h
MTR3CCD02800KMA MM102800A(New)	2.8M/ICX674ALG(M) 2/3“ (8.81x6.63)	4.54x4.54	950mv with 1/30s 4mv with 1/30s	15@1938x1460 17@1610x1212 18@1930x1092	1x1 1x1 1x1	0.05ms~1h
MTR3CCD01400KPA MP101400A	1.4M/ICX285AQ(C) 2/3“ (8.88x6.70)	6.45x6.45	1240mv with 1/30s 10mv with 1/30s	15@1360x1024	1x1	0.07ms~1h
MTR3CCD01400KMA MM101400A	1.4M/ICX285AL(M) 2/3“ (8.88x6.70)	6.45x6.45	1300mv with 1/30s 11mv with 1/30s	15@1360x1024	1x1	0.07ms~1h
MTR3CCD01400KPB MP101400B(New)	1.4M/ICX825AQA(C) 2/3“ (8.88x6.70)	6.45x6.45	2000mv with 1/30s 4.8mv with 1/30s	25@1376x1040	1x1	0.07ms~1h
MTR3CCD01400KMB MM101400B(New)	1.4M/ICX825ALA(M) 2/3“ (8.88x6.70)	6.45x6.45	2000mv with 1/30s 4.8mv with 1/30s	25@1376x1040	1x1	0.07ms~1h

C:Color; M:Monochrome;

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine/NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
ADC	8 Bit / 14 Bit
Recording System	Still Picture and Movie
Cooling System*	Two-stage TE-cooling System -45 °C below Camera Body Temperature
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port External Power Adapter for Cooling System, DC12V, 3A
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB3.0 High-speed Port
	Display:17” or Larger
	CD-ROM

4.1.3 MTR3CCD Series Dimension

The MTR3CCD series body, made from tough, alloy with CNC technique, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT or AR to block the IR light or protect the camera sensor. The fan's vibration is minimized to the low level to eliminate the vibration caused imaging blur. This design ensures a rugged, robust solution with an increased lifespan when compared to the other industrial camera solutions.



Dimension of MTR3CCD Series

4.1.4 Packing Information for MTR3CCD Series

Packing Information of MTR3CCD Series

Standard Package			
A	Carton L:50cm W:30cm H:30cm (20pcs, 12~17Kg/ carton), not shown in the photo		
B	3-A safety equipment case: L:28cm W:23cm H:15cm (1pcs, 2.8Kg/ box); Carton size:L:28.2cm W:25.2cm H:16.7cm		
C	One MTR3CCD series camera(C-mount)		
D	Power adapter: input: AC 100~240V 50Hz/60Hz, output: DC12 V 3A		
E	High-speed USB3.0 A male to B male gold-plated connectors cable /2.0m		
F	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
G	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075 108004/AMA100
		C-Mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075 108011/ATA100
H	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075 108008/FMA100
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075 108014/FTA100
Note: For G and H optional items, please specify your camera type(C-mount, microscope camera or telescope camera), ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
I	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
J	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
K	External trigger control line		
L	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

5 Microscope USB3.0 CCD Camera

5.1 U3CCD Series C-mount USB3.0 CCD Camera

5.1.1 The Basic Characteristic of U3CCD Series(10)

ToupTek U3CCD series is an ExView HAD CCD series camera. It adopts Sony ExView HAD CCD sensor as the image-picking device. Sony ExView HAD CCD is a CCD that drastically improves light efficiency by including near infrared light region as a basic structure of HAD (Hole-Accumulation-Diode) sensor. USB3.0 is used as the data transfer interface.

U3CCD series hardware resolutions range from 1.4M to 12M and comes with the integrated CNC aluminum alloy compact housing.

U3CCD series comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/Linux/ OSX multiple platforms SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

The U3CCD series can be widely used in bright field light environment and microscope image capture and analysis with higher frame rate.

The basic series characteristic of U3CCD series is as follows:

- Standard C-Mount camera with SONY ExView HAD CCD II sensors;
- IR-CUT coated windows
- Up to 1000s long time exposure;
- USB3.0 5Gbit/second interface ensuring high speed data transmission;
- Ultra-Fine color engine with perfect color reproduction capability;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain control API;

5.1.2 U3CCD Series Datasheet (10)

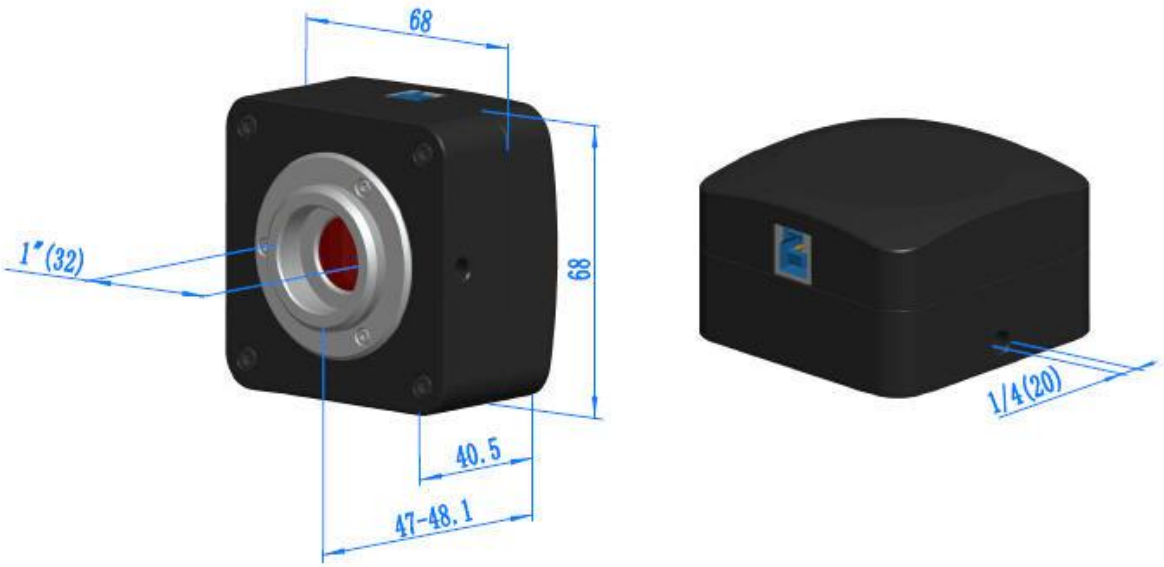
Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution	Binning	Exposure
U3CCD12000KPA NP112000A(New)	12M/ICX834AQG(C) 1“ (13.15x8.77)	3.1x3.1	420mv with 1/30s 15.2mv with 1/30s	3.6@4248x2836 3.6@2124x1418	1x1 2x2	0.06ms~1000s
U3CCD12000KMA NM112000A(New)	12M/ICX834ALG(M) 1“ (13.15x8.77)	3.1x3.1	420mv with 1/30s 12mv with 1/30s(F8.0)	3.6@4248x2836 3.6@2124x1418	1x1 2x2	0.06ms~1000s
U3CCD09000KPA NP109000A(New)	9.0M/ICX814AQG(C) 1“ (12.47x9.98)	3.69x3.69	580mv with 1/30s 12mv with 1/30s	4.4@3388x2712 4.4@1694x1356	1x1 2x2	0.06ms~1000s
U3CCD09000KMA NM109000A(New)	9.0M/ICX814ALG(M) 1“ (12.47x9.98)	3.69x3.69	660mv with 1/30s 12mv with 1/30s(F8.0)	4.4@3388x2712 4.4@1694x1356	1x1 2x2	0.06ms~1000s
U3CCD06000KPA NP106000A	6.0M/ICX695AQG(C) 1“ (12.48x9.99)	4.54x4.54	880mv with 1/30s 8mv with 1/30s	7.5@2748x2200 14@2748x1092	1x1	0.06ms~1000s
U3CCD06000KMA NM106000A	6.0M/ICX695ALG(M) 1“ (12.48x9.99)	4.54x4.54	1000mv with 1/30s 8mv with 1/30s	7.5@2748x2200 14@2748x1092	1x1	0.06ms~1000s
U3CCD02800KPA NP102800A	2.8M/ICX674AQG(C) 2/3“ (8.81x6.63)	4.54x4.54	800mv with 1/30s 4mv with 1/30s	15@1938x1460 17@1610x1212 18@1930x1092	1x1	0.05ms~1000s
U3CCD02800KMA NM102800A	2.8M/ICX674ALG(M) 2/3“ (8.81x6.63)	4.54x4.54	950mv with 1/30s 4mv with 1/30s	15@1938x1460 17@1610x1212 18@1930x1092	1x1	0.05ms~1000s
U3CCD01400KPB NP101400B(New)	1.4M/ICX825AQA(C) 2/3“ (8.88x6.70)	6.45x6.45	2000mv with 1/30s 4.8mv with 1/30s	25@1376x1040	1x1	0.07ms~1000s
U3CCD01400KMB NM101400B(New)	1.4M/ICX825ALA(M) 2/3“ (8.88x6.70)	6.45x6.45	2000mv with 1/30s 4.8mv with 1/30s	25@1376x1040	1x1	0.07ms~1000s

C: Color; M: Monochrome;

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine/NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
ADC	8 Bit / 14 Bit
Recording System	Still Picture and Movie
Cooling System*	Natural
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory: 2GB or More
	USB Port: USB3.0 High-speed Port
	Display: 17” or Larger
	CD-ROM

5.1.3 Dimension of U3CCD Series Camera

The U3CCD body, made from tough, CNC aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



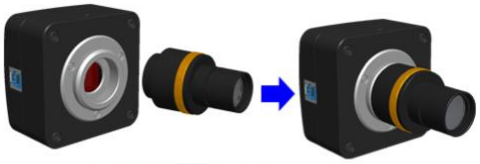
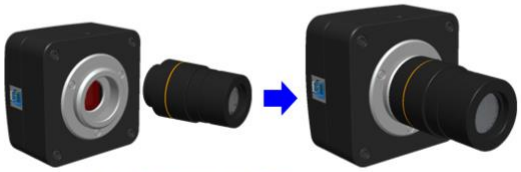
Dimension of U3CCD Series Camera

5.1.4 Packing Information for U3CCD Series Camera

Packing Information of U3CCD Series Camera

Standard Camera Packing List			
A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo		
B	Gift box L:15cm W:15cm H:10cm (0.7~0.75Kg/ box)		
C	U3CCD series USB3.0 C-mount CMOS camera		
D	High-speed USB3.0 A male to B male gold-plated connectors cable /2.0m		
E	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
F	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075 108004/AMA100
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075 108011/ATA100
G	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075 108008/FMA100
		C-Mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075 108014/FTA100
Note: For F and G optional items, please specify your camera type(C-mount, microscope camera or telescope camera) , ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
H	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
I	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
J	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube		
K	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

5.1.5 Extension of U3CCD Series with Microscope or Telescope Adapter

<table>
<tr><th>Extension</th><th colspan="2">Picture</th></tr>
<tr><td>C-mount Camera</td><td>  </td><td>Machine vision; Medical imaging;
Semiconductor equipment; Test instruments;
Document scanners; 2D barcode readers;
Web camera and security video;
Microscope imaging;</td></tr>
<tr><td>Microscope Camera</td><td colspan="2" rowspan="2"> 
U3CCD+AMAXXX(23.2mm Adapter)
 
U3CCD+FMAXXX(23.2mm Adapter)
 
U3CCD+ATAXXX(31.75mm Adapter)
 
U3CCD+FTAXXX(31.75mm Adapter)</td></tr>
<tr><td>Telescope Camera</td></tr>
</table>

6 Microscope USB2.0 CCD Camera

6.1 EXCCD Series C-mount USB2.0 CCD Camera(4)

6.1.1 The Basic Characteristic of EXCCD Series

ToupTek EXCCD series is an ExView HAD CCD camera and it adopts Sony ExView HAD CCD sensor as the image-picking device. Sony ExView HAD CCD is a CCD that drastically improves light efficiency by including near infrared light region as a basic structure of HAD (Hole-Accumulation-Diode) sensor. ToupTek uses EXCCD for simplicity. USB2.0 is used as the data transfer interface.

EXCCD series comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/Linux/OSX multiple platform SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

The EXCCD vcan be widely used in low light environment and microscope fluorescence image capture and analysis.

The basic characteristic EXCCD series is as follows:

- Standard C-Mount camera with SONY ExView sensors;
- USB2.0 interface ensuring high speed data transmission;
- Ultra-Fine color engine with perfect color reproduction capability;
- With advanced video & image processing application ToupView/ ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

6.1.2 EXCCD Series Datasheet(4)

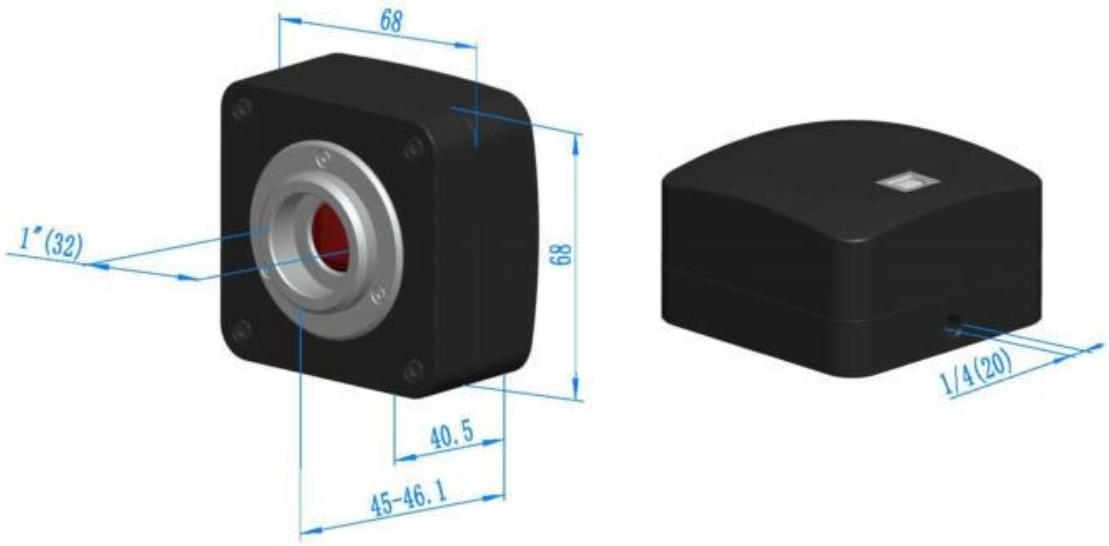
Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution	Binning	Exposure
EXCCD01400KPA TP801400A	1.4M/ICX285AQ(C) 2/3“ (8.77x6.60)	6.45x6.45	1240mv with 1/30s 10mv with 1/30s	15@1360x1024	1x1	0.12ms~240s
EXCCD01400KMA TM801400A	1.4M/ICX285AL(M) 2/3“ (8.77x6.60)	6.45x6.45	1300mv with 1/30s 11mv with 1/30s	15@1360x1024	1x1	0.12ms~240s
EXCCD00440KMA TM800440A	0.44M/ICX829AL(M) 1/2"(6.43x4.80)	8.6X8.3	2800mv with 1/30s 2mv with 1/30s	46@748X578	1x1	0.20ms~1h
EXCCD00300KMA TM800300A	0.3M ICX618AL(M) 1/4“ (3.58x2.69)	5.6x5.6	1200mv with 1/30s 4mv with 1/30s	72@640x480	1x1	0.06ms~40s

C: Color; M: Monochrome;

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment /NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine /NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc.)
ADC	8 Bit / 12 Bit
Recording System	Still Picture and Movie
Cooling System*	Natural
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB2.0 High-speed Port
	Display:17” or Larger
	CD-ROM

6.1.3 Dimension of EXCCD Series

The EXCCD series body, made from tough, aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



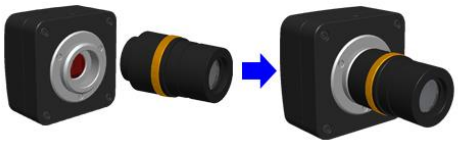
Dimension of EXCCD Series

6.1.4 Packing Information of EXCCD Series

Packing Information of EXCCD Series

Standard Camera Packing List			
A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo		
B	Gift box L:15cm W:15cm H:10cm (0.67~0.80Kg/ box)		
C	One EXCCD series camera		
D	High-speed USB2.0 A male to B male gold-plated connectors cable /2.0m		
E	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
F	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075
		C-Mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075
G	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075
Note: For F and G optional items, please specify your camera type(C-mount, microscope camera or telescope camera), ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
H	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
I	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
J	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube		
K	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

6.1.5 Extension of EXCCD Series with Microscope or Telescope Adapter

<table>
<tr><th>Application</th><th colspan="2">Picture</th></tr>
<tr><td>C-mount Camera</td><td>  </td><td>Machine vision; Medical imaging;
Semiconductor equipment; Test instruments;
Document scanners; 2D barcode readers;
Web camera and security video;
Microscope imaging;</td></tr>
<tr><td>Microscope Camera</td><td colspan="2"> 
EXCCD+AMAXXX(23.2mm Adapter)
 
EXCCD+FMAXXX(23.2mm Adapter)</td></tr>
<tr><td>Telescope Camera</td><td colspan="2"> 
EXCCD+ATAXXX(31.75mm Adapter)
 
EXCCD+FTAXXX(31.75mm Adapter)</td></tr>
</table>

6.2 UHCCD Series C-mount USB2.0 CCD Camera(9)

6.2.1 UHCCD Basic Characteristic

ToupTek UHCCD series is an ultra-high performance Super HAD CCD camera. The camera adopts Sony Super HAD CCD sensor as the image-picking device; The Super HAD CCD is a version of Sony's high performance CCD HAD (Hole-Accumulation Diode) sensor with sharply improved sensitivity by the incorporation of a new semiconductor technology developed by Sony corporation. USB2.0 is used as the data transfer interface.

UHCCD series comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/Linux/OSX multiple platform SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

The UHCCD series can be widely used in bright field light environment and microscope image capture and analysis.

The basic characteristic of UHCCD series is as follows:

- Standard C-Mount camera with SONY Super HAD CCD sensor;
- USB2.0 interface ensuring high speed data transmission;
- Ultra-Fine color engine with perfect color reproduction capability;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

6.2.2 UHCCD Series Datasheet(9)

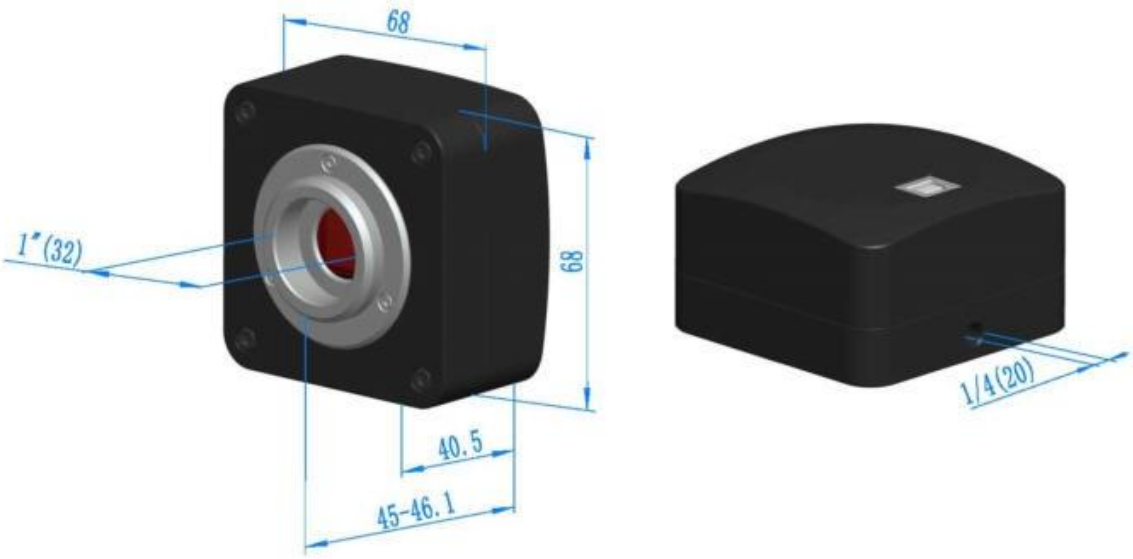
Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution	Binning	Exposure
UHCCD05200KPA TP705200A	5.2M/ICX655AQ(C) 2/3“ (8.44x7.07)	3.45x3.45	420mv with 1/30s 4mv with 1/30s	4.3@2448x2050 10.5@960x720	1x1	0.22ms~60s
UHCCD05100KPA TP705100A	5.1M/ICX452AQ(C) 1/1.8“ (7.19x5.39)	2.775x2.775	260mv with 1/30s 16mv with 1/30s	4@2592x1944 35@560x420	1x1 2x2	0.212ms~77ms
UHCCD05000KPA TP705000A	5.0M/ICX282AQ(C) 2/3“ (8.70x6.53)	3.40x3.40	280mv with 1/30s 16mv with 1/30s	4.5@2560x1920 9@1280x960	1x1 2x2	0.203ms~60s
~~UHCCD03100KPB~~ ~~TP703100B(Suspended)~~	3.1M/ICX252AQ(C) 1/1.8“ (7.06x5.30)	3.45x3.45	270mv with 1/30s 12mv with 1/30s	6@2048x1536 41@640x480	1x1 2x2	0.178ms~77ms,
UHCCD02000KPA TP702000A	2.0M/ICX274AQ(C) 1/1.8“ (7.04x5.28)	4.40x4.40	420mv with 1/30s 8mv with 1/30s	10@1600x1200	1x1	0.135ms~60s
UHCCD01400KPA TP701400A	1.4M/ICX205AK(C) 1/2“ (6.32x4.76)	4.65x4.65	400mv with 1/30s 16mv with 1/30s	8@1360x1024	1x1	0.227ms~60s
UHCCD01400KPB TP701400B	1.4M/ICX205AK(C) 1/2“ (6.32x4.76)	4.65x4.65	400mv with 1/30s 16mv with 1/30s	15@1360x1024	1x1	0.127ms~60s
UHCCD01400KMB TM701400B	1.4M/ICX205AL(M) 1/2“ (6.32x4.76)	4.65x4.65	450mv with 1/30s 16mv with 1/30s	15@1360x1024	1x1	0.127ms~60s
UHCCD00800KPA TP700800A	0.8M/ICX204AK(C) 1/3“ (4.76x3.57)	4.65x4.65	400mv with 1/30s 6mv with 1/30s	16@1024x768	1x1	0.16ms~60s

C:Color; M:Monochrome;

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine/NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
ADC	8 Bit /12 Bit
Recording System	Still Picture and Movie
Cooling System*	Natural
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB2.0 High-speed Port
	Display:17” or Larger
	CD-ROM

6.2.3 Dimension of UHCCD Series

The UHCCD series body, made from tough, aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



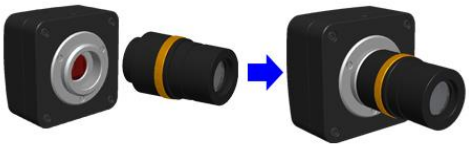
Dimension of UHCCD Series

6.2.4 Packing Information of UHCCD Series

Packing Information of UHCCD Series

Standard Camera Packing List			
A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo		
B	Gift box L:15cm W:15cm H:10cm (0.67~0.8Kg/ box)		
C	One UHCCD series camera		
D	High-speed USB2.0 A male to B male gold-plated connectors cable /2.0m		
E	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
F	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075
G	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075
Note: For F and G optional items, please specify your camera type(C-mount, microscope camera or telescope camera) , ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
H	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
I	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
J	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube		
K	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

6.2.5 Extension of UHCCD Series with Microscope or Telescope Adapter

Extension	Picture	
C-mount Camera		Machine vision; Medical imaging; Semiconductor equipment; Test instruments; Document scanners; 2D barcode readers; Web camera and security video; Microscope imaging;
Microscope Camera	 UHCCD+AMAXXX(23.2mm Adapter)	 UHCCD+FMAXXX(23.2mm Adapter)
Telescope Camera	 UHCCD+ATAXXX(31.75mm Adapter)	 UHCCD+FTAXXX(31.75mm Adapter)

7 LHCCD Series USB2.0 Linear CCD Camera

7.1 The Basic Characteristic of LHCCD Series（3）

- Linear USB2.0 CCD camera with C-mount, f-mount, and M72x0.75 photography standards;
- 2048~3648 pixels silicon linear CCD array;
- 16-Bit A/D converter for high intensity resolution;
- External trigger capability;
- Optical integration time adjustable from 2 to 4000ms;
- Board-level camera, ideal for OEM applications;
- No external power supply required;
- High scan rate (up to 120 scans/second);
- SDK for user applications;
- Demo graphical user interface;
- Compatible to Windows XP, Vista and 7/8(32 or 64 bit);

7.2 LHCCD Series Datasheet

Order Code	Sensor	Size(mm)	Pixel(μm)	FPS/Resolution	Binning	Exposure(ms)
LHCCD00511	ILX511 (M)	28mm	14x200	475@2048	NA	2ms~4000ms,
LHCCD00554	ILX554 (M)	28mm	14x56	475@2048	NA	2ms~4000ms
LHCCD01304	TCD1304 (M)	29.184mm	8x200	125@3648	NA	3.8ms~4000ms

Other Hardware Configuration	
Capture/Control SDK	SDK and Example Code
Capture Mode	Single Camera Multiple Instance and Multiple Cameras Supported
Lens Mount(Optional)	M42
Host Interface	USB2.0
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 /8 (32 & 64 Bit)
PC Requirements	CPU: Equal to Intel Core 2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB2.0 High-speed Port
Operating Environment	
Operating Temperature	-30~70
Storage Temperature	-40~85
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V Over USB Port

8 Microscope TE-Cooling USB3.0 CMOS Camera

8.1 sMAX Series TE-Cooling C-mount USB3.0 /Camera Link CMOS Camera(2)

8.1.1 The Basic Characteristic of sMAX Series

sMAX series camera adopts with GSENSE's big pixel size or full-frame CMOS sensor as the image-picking device and USB3.0 /CameraLink is used as the data transfer interface to increase the frame rate.

With the two-stage peltier cooling sensor chip to 40°C below ambient temperature. This will greatly increase the signal to noise ratio and decrease the image noise. Smart structure is designed to assure the heat radiation efficiency and avoid the moisture problem. Electric fan is used to increase the heat radiation speed.

sMAX series comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/Linux/ OSX multiple platform SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API.

The sMAX series can be widely used in low light environment and microscope fluorescence image capture and analysis, as well as the astronomy deep sky application.

The basic characteristic of sMAX series camera can be summarized as follows:

- Standard camera with GSENSE CMOS sensors;
- Big pixels or full-frame sensor size;
- Two-stage TE-cooling with controllable electric fan;
- Sensor chip cooling up to 40°C below ambient temperature;
- Working temperature can be regulated to specified temperature in 5 minutes;
- Smart structure to assure the heat radiation efficiency and avoid the moisture problem;
- IR-CUT/AR coated window (Optional);
- USB3.0 /Camera Link 5Gbit/second or 1000MB/second interface ensuring high speed data transmission;
- Up to 1h long time exposure;
- Embedded up to 16bit hardware ISP module;
- Ultra-Fine color engine with perfect color reproduction capability;
- Including 2-D denoising and sharpening;
- Support the capture of video and image in software / hardware trigger mode;
- With advanced video & image processing application ToupView/ToupLite;
- Support both video and trigger modes;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain control API;

8.1.2 sMAX Series Datasheet(2)

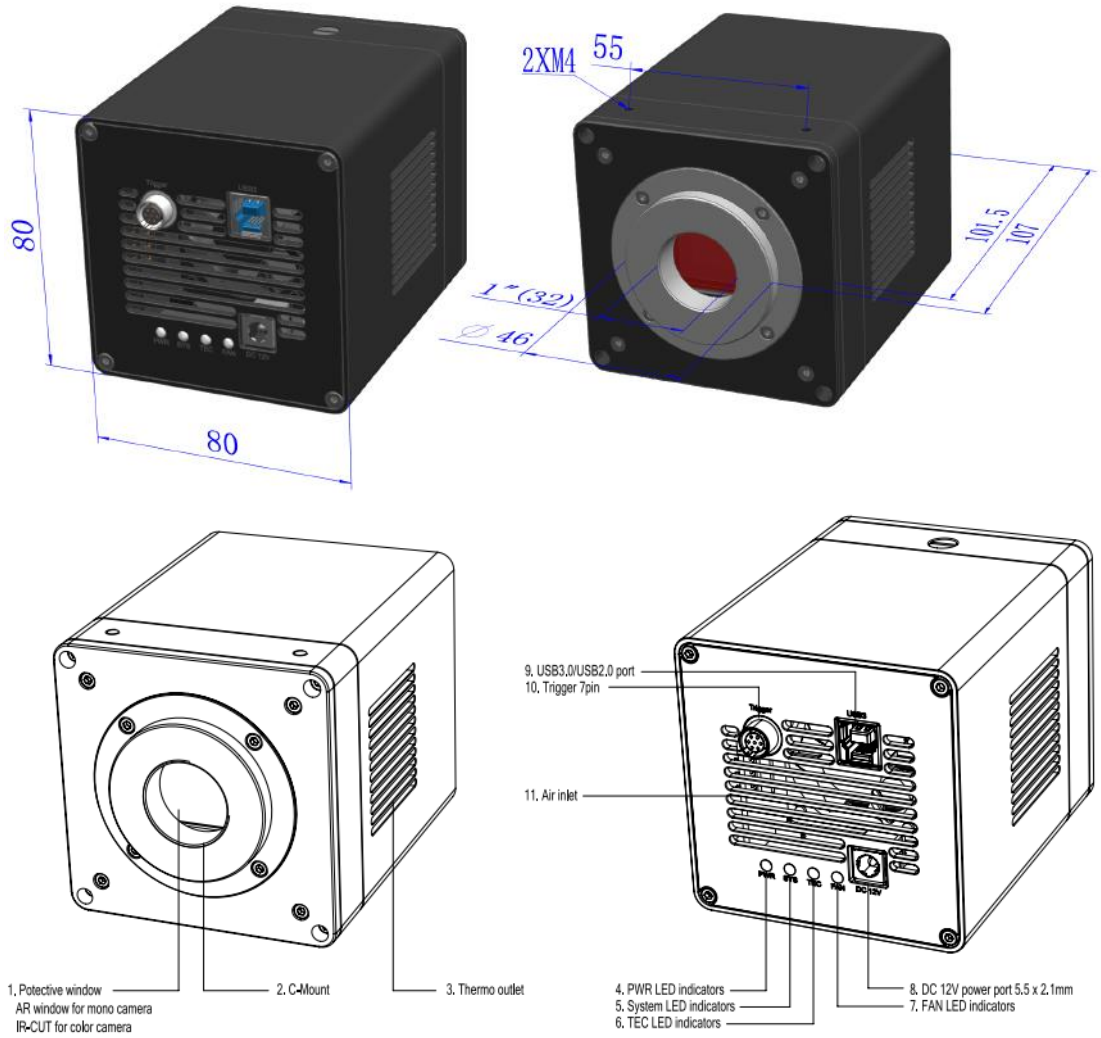
Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution ADC	Binning	Exposure
sMAX04BM 20231018	4.2M/GSENSE2020BSI (M,UV,RS) 1.2”(13.31x13.31)	6.5 x 6.5	$1.1x10^8$(e-/((W/m2).s)) Peak QE 94% @550nm 0.21(e-/s/pix) @-20C 65.58dB/34.83dB	74@2048 x2048(11-bit ADC) 74@1024 x1024(11-bit ADC) 8 Bit / HDR 16 Bit	1x1 2x2	0.012ms~1h
sMAX04BM-CL100 20231018	4.2M/GSENSE2020BSI (M,UV,RS) 1.2”(13.31x13.31)	6.5 x 6.5	$1.1x10^8$(e-/((W/m2).s)) Peak QE 94% @550nm 0.21(e-/s/pix) @-20C	100@2048 x2048(11-bit ADC) 100@1024 x1024(11-bit ADC) 8 Bit / HDR 16 Bit	1x1 2x2	0.012ms~1h

C: Color; M:Monochrome; UV: Ultra-violet sensitive; CL: Camera Link

Other Specification	
Spectral Range	200-1000nm(The spectral response range of each model is different. Please refer to the product manual of each model for detailed parameters)
Protect Windows	IR CUT (AR protection glass is optional)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine/NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK (Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
Recording System	Still Picture and Movie (Free running mode or trigger mode)
Cooling System*	Two-stage TE-cooling System -40 °C below Camera Body Temperature
IO Interface	One optocoupler isolation input, one optocoupler isolation output, two direct connection GPIO
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	External Power Adapter for Camera and Cooling System, DC19V, 4A
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port: USB3.0 High-speed Port CL Port: PCIE Slot
	Display:17” or Larger
	CD-ROM

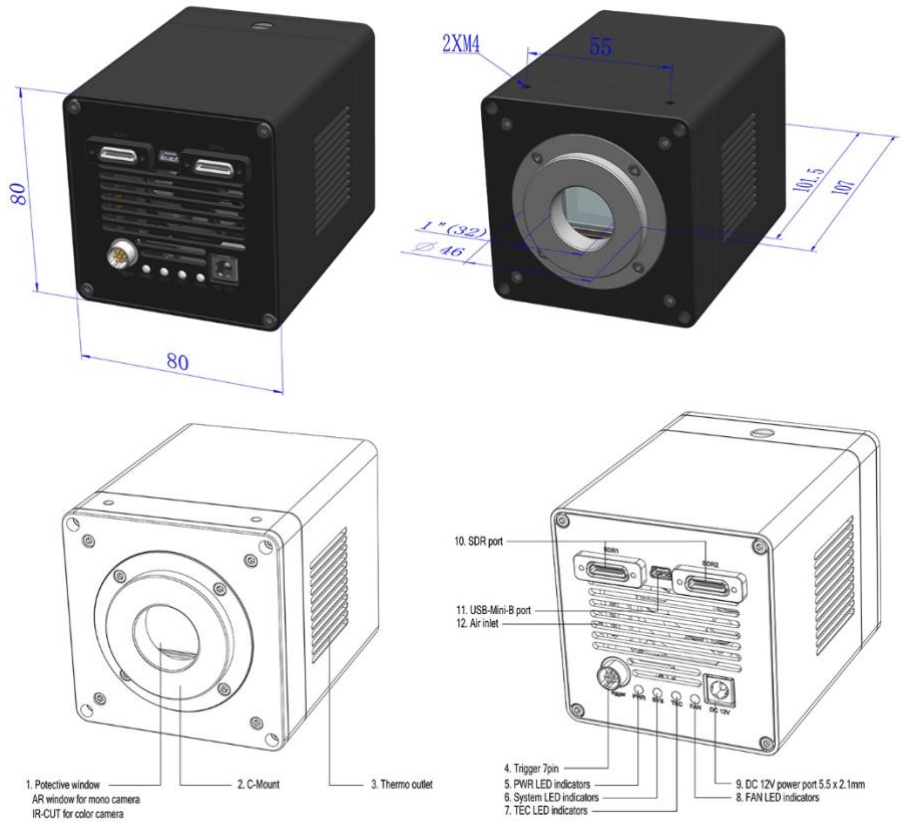
8.1.3 Dimension of sMAX Series and Connection

The sMAX series body, made from tough, alloy with CNC technique, ensures a heavy duty, workhorse solution. The camera is designed with a high-quality IR-CUT or AR to block the IR light or protect the camera sensor. The fan 's vibration is minimized to the low level to eliminate the vibration caused imaging blur. This design ensures a rugged, robust solution with an increased lifespan when compared to the other industrial camera solutions.



Dimension of sMAX (Square) Series(USB3.0)

Item	Specification
1	Protective window, AR window for mono camera, IR-cut for color camera
2	C / M42 thread
3	Thermo outlet
4	LED indicators
5	System LED TEC LED
6	TEC LED indicators
7	Fan LED indicators
8	DC 12V power port, 5.5 × 2.1mm
9	USB 3.0/ USB 2.0 port
10	Trigger(7 pin)
11	Air inlet Power



Dimension of sMAX (Square) Series(Camera Link)

8.1.4 Packing Information for sMAX Series Camera (USB3.0)

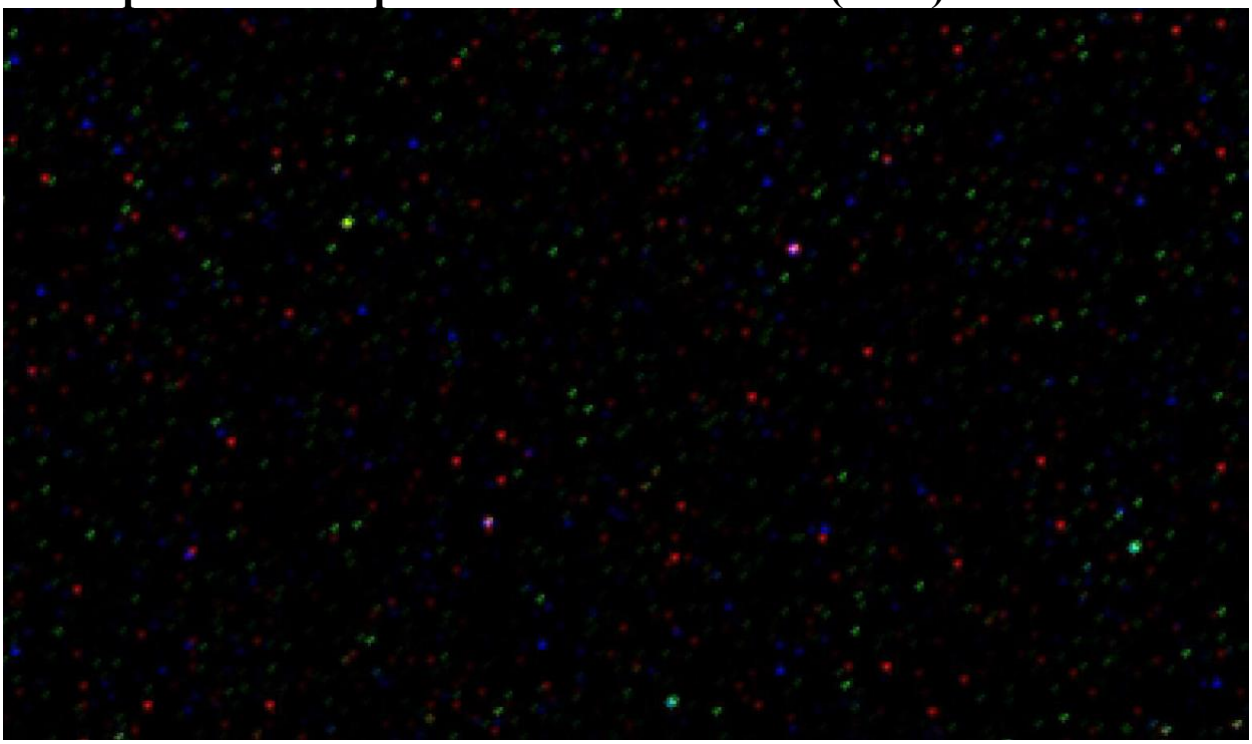
Packing Information of sMAX Series Camera(USB3.0)

Standard Package			
A	Carton L:50cm W:30cm H:30cm (20pcs, 12~17Kg/ carton), not shown in the photo(TBD)		
B	3-A safety equipment case: L:28cm W:23cm H:15cm (1pcs, 2.8Kg/ box); Carton size:L:28.2cm W:25.2cm H:16.7cm(TBD)		
C	One sMAX series camera(C-mount)		
D	Drying tube and desiccant		
E	Power adapter: input: AC 100~240V 50Hz/60Hz, output: DC12 V 3A		
F	High-Speed USB3.0 A male to B male gold-plated connectors cable /1.5m		
G	IO cable		
H	CD (Driver & utilities software, Ø12cm)		
Optional Accessory（Not shown in the Photo）			
I	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075 108004/AMA100
J	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075 108008/FMA100
Note: For **I** and **J** optional items, please specify your camera type(C-mount, microscope camera or telescope camera), ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
K	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
L	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
M	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

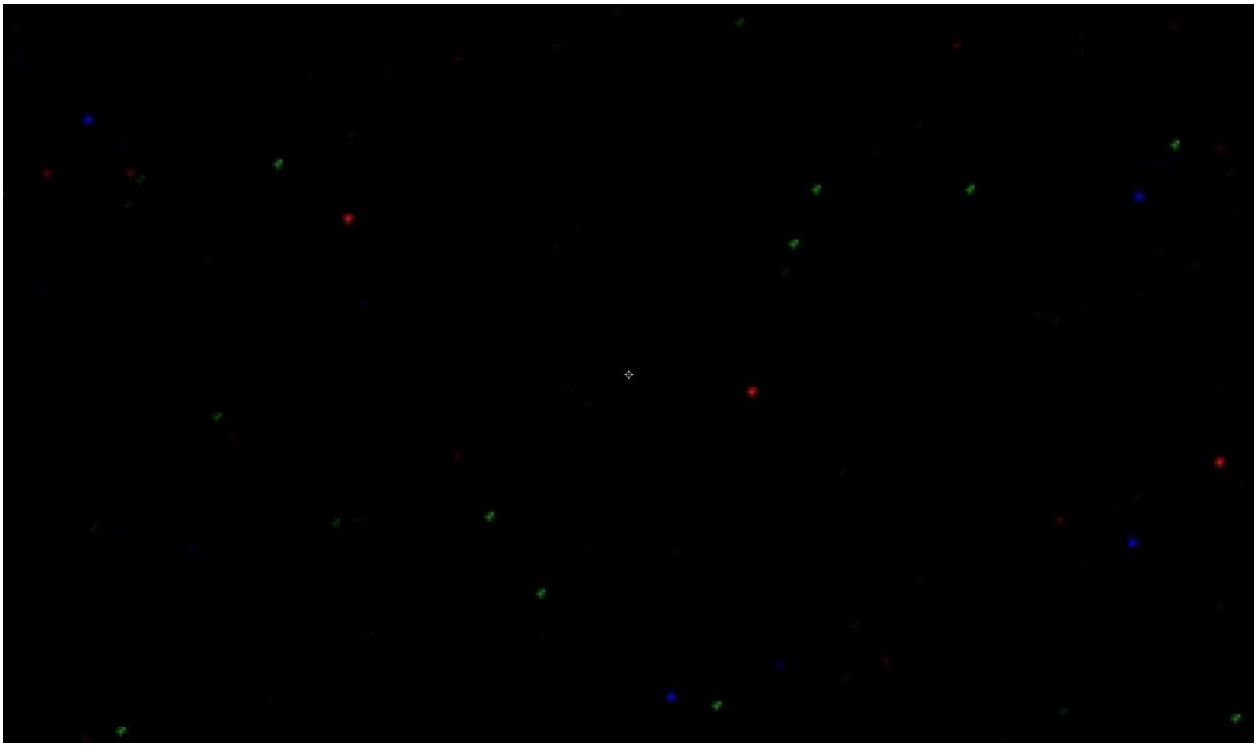
8.1.5 Packing Information for sMAX Series Camera(Camera Link)

Standard Packing information	
A	3-A equipment case: L:28cm W:23cm H:15.5cm (1pcs, 2.8Kg/ box)
B	sMax Camera Link interface camera
C	2 CameraLink cables
D	12V/3A 6 PIN air plug power adapter
E	Power cord. National standard, American standard, European standard, British standard power cord (D1, D2, D3, D4) for choosing
F	One external trigger control cable
Optional Accessary	

8.1.6 Sample Photos Captured with MAX Series (TBD)



Hot noise for the MAX at Gain 20 , 600 second, 15 Centidegree



Hot noise for the MAX Gain 20 , 600 second, minus 15 Centidegree

8.2 MAX Series TE-Cooling M52/C-mount USB3.0 CMOS Camera(6)

8.2.1 The Basic Characteristic of MAX Series

MAX series camera adopts SONY Exmor or GSENSE with big pixel size or full-frame CMOS sensor as the image-picking device and USB3.0 is used as the transfer interface to increase the frame rate.

With the two-stage peltier cooling sensor chip to -40°C below ambient temperature. This will greatly increase the signal to noise ratio and decrease the image noise. Smart structure is designed to assure the heat radiation efficiency and avoid the moisture problem. Electric fan is used to increase the heat radiation speed.

MAX series comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/Linux/ OSX multiple platform SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

The MAX series can be widely used in low light environment and microscope fluorescence image capture and analysis, as well as the astronomy deep sky application.

MAX Series (Square Housing)

The basic characteristic of MAX series can be summarized as follows:

- Standard camera with SONY Exmor or GSENSE CMOS sensors;
- Big pixels or full-frame sensor size;
- Two-stage TE-cooling with controllable electric fan;
- Sensor chip cooling up to-40°C below ambient temperature;
- Working temperature can be regulated to specified temperature in 5 minutes;
- Smart structure to assure the heat radiation efficiency and avoid the moisture problem;
- IR-CUT/AR coated windows(Optional);
- M52 x0.75 or C-mount
- USB3.0 5Gbit/second interface ensuring high speed data transmission;
- Up to 1000 seconds long time exposure;
- Embedded up to 16bit hardware ISP module;
- Including 2-D denoising and sharpening
- Ultra-Fine color engine with perfect color reproduction capability;
- Support the capture of video and image in software / hardware trigger mode
- With advanced video & image processing application ToupView/ToupLite;
- Support both video and trigger modes;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain control API;

8.2.2 MAX Series Datasheet(6)

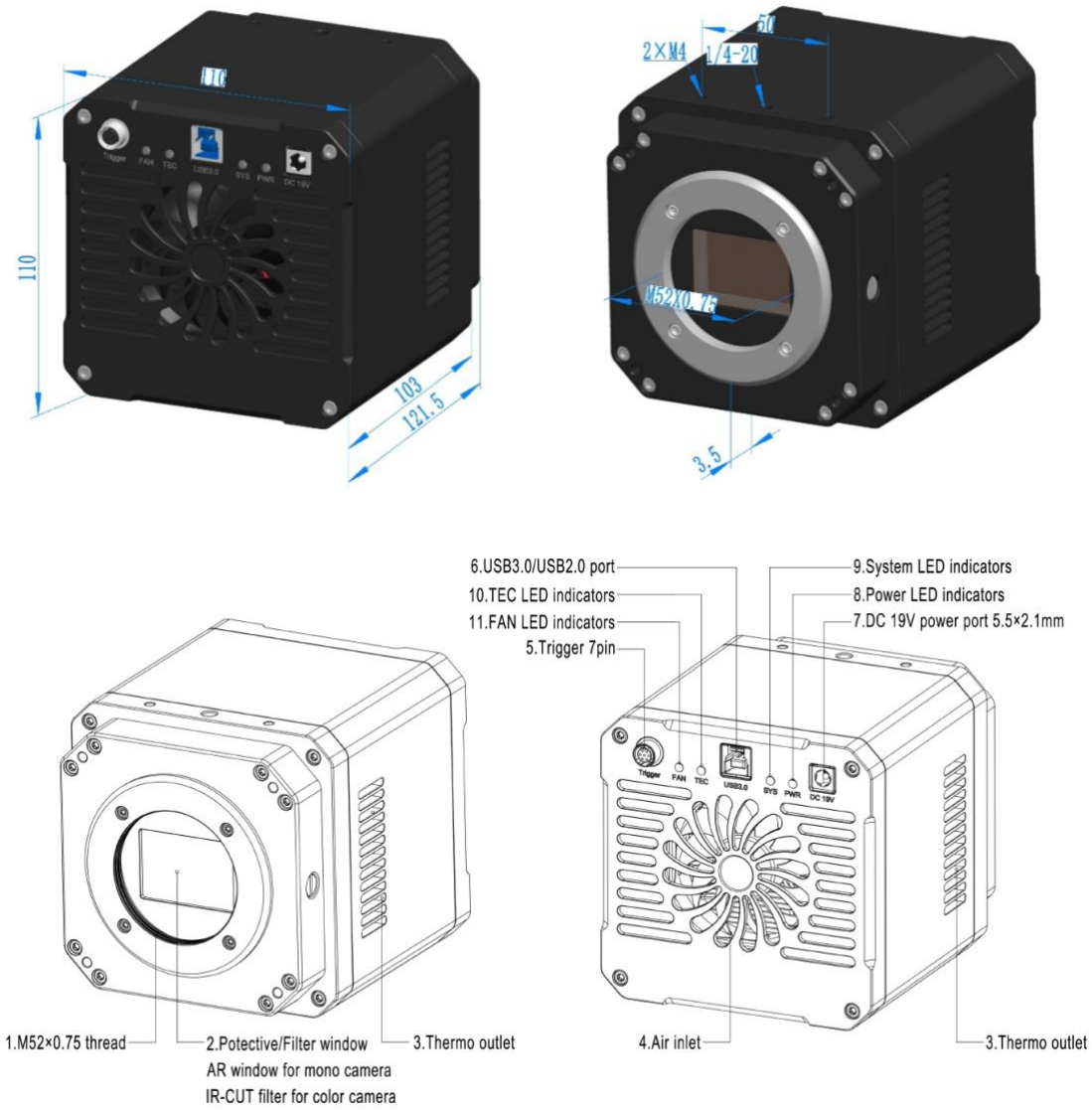
Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution ADC	Binning	Exposure
MAX62AM MM1062A	61M/IMX455(M, RS) 2.7"(35.98x23.99) Full Frame	3.76x3.76	871mv with 1/30s 0.039mv with 1/30s 88.3dB/47.1dB	6.1@9568x6380(16bit) 19.1@4784x3190 55.6@3184x2124 191@1040x706 8 Bit / 16 Bit	1x1 2x2 3x3 9x9	0.1ms~1000s
MAX62AC MP1062AC	61M/IMX455(C, RS) 2.7"(35.98x23.99) Full Frame	3.76x3.76	484.5mv with 1/30s 0.039mv with 1/30s 85.8dB/47.0dB	6.1@9568x6380(16bit) 19.1@4784x3190 55.6@3184x2124 191@1040x706 8 Bit / 16 Bit	1x1 2x2 3x3 9x9	0.1ms~1000s
MAX24AC MP1024A	24M/IMX410(C, RS) 2.7"(36.02x24.00) Full Frame	5.94x5.94	573mv with 1/30s 0.037mv with 1/30s 87.3dB/50.2dB	15.3@6064x4040(14bit) 41@3024x2012 114@2016x1342 8 Bit / 14 Bit	1x1 2x2 3x3	0.1ms~1000s
MAX04AM MM1004A	4.2M/GSENSE2020e(M,NIR,RS) 1.2"(13.31x13.31)	6.5x 6.5	$8.1x10^7$(e-/((W/m2).s)) Peak QE 64.2% @595nm 0.12(e-/s/pix)@-10C 81.6dB/46.5dB	45@2048x2048 45@1024 x 1024 8 Bit / HDR 16 Bit	1x1 2x2	0.1ms~1000s
MAX04BM MM1004B	4.2M/GSENSE2020BSI(M, UV,RS) 1.2"(13.31x13.31)	6.5 x 6.5	$1.1x10^8$(e-/((W/m2).s)) Peak QE 93.7% @550nm 0.15(e-/s/pix)@-15C 79.1dB/47dB	45@2048 x2048 45@1024 x1024 8 Bit / HDR 16 Bit	1x1 2x2	0.1ms~1000s
MAX04CM MM1004C	4.2M/GSENSE400BSI(M, UV,RS) 2.0"(22.53x22.53)	11 x 11	$3.25x10^8$(e-/((W/m2).s)) Peak QE 95.3% @560nm 1.5(e-/s/pix)@-10C 93.9dB/48.8dB	44@2048 x2048 44@1024 x1024 8 Bit / HDR 16 Bit	1x1 2x2	0.1ms~1000s

C:Color; M:Monochrome; UV: Ultra-violet sensitive

Other Specification	
Spectral Range	200-1000nm(The spectral response range of each model is different. Please refer to the product manual of each model for detailed parameters)
Protect Windows	IR CUT (AR protection glass is optional)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine/NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
Recording System	Still Picture and Movie(Free running mode or trigger mode)
Cooling System*	Two-stage TE-cooling System -40 °C below Camera Body Temperature
IO Interface	One optocoupler isolation input, one optocoupler isolation output, two direct connection GPIO
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port External Power Adapter for Cooling System, DC19V, 4A
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB3.0 High-speed Port
	Display:17" or Larger
	CD-ROM

8.2.3 Dimension of MAX Series and Connection

The MAX series body, made from tough, alloy with CNC technique, ensures a heavy duty, workhorse solution. The camera is designed with a high-quality IR-CUT or AR to block the IR light or protect the camera sensor. The fan's vibration is minimized to the low level to eliminate the vibration caused imaging blur. This design ensures a rugged, robust solution with an increased lifespan when compared to the other industrial camera solutions.



Dimension of MAX (Square) Series

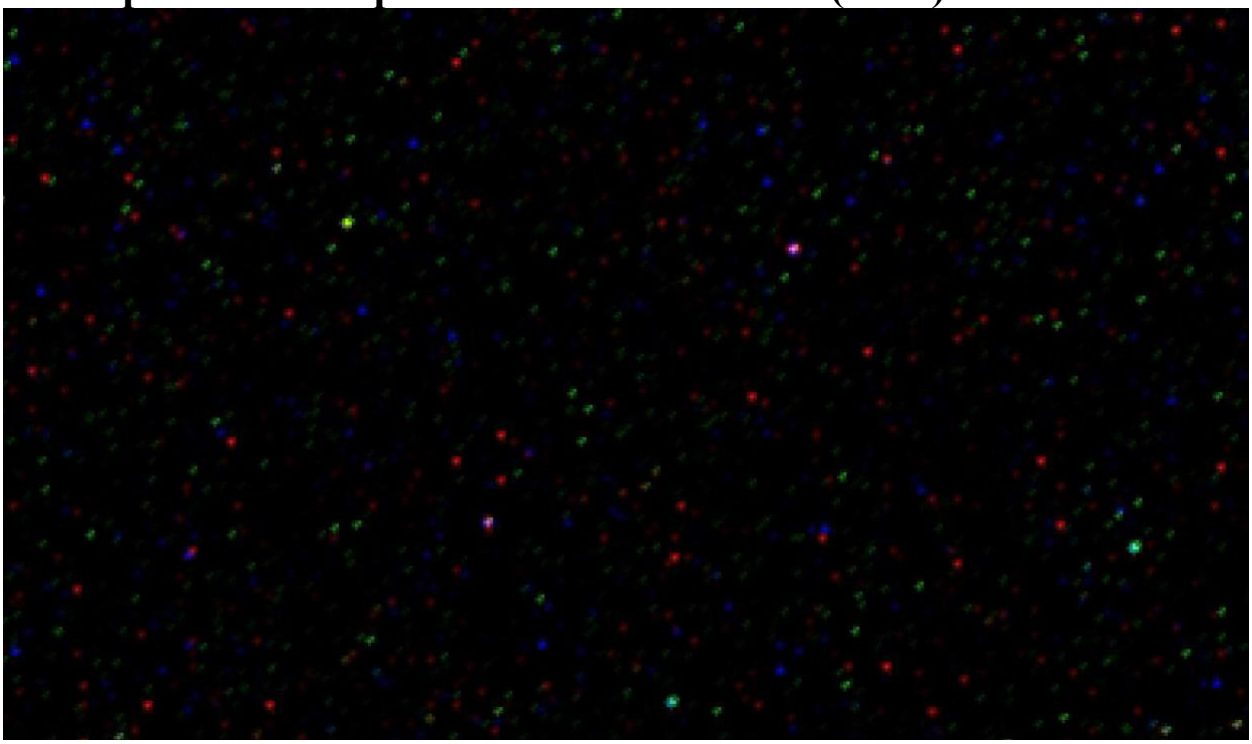
Item	Specification
1	M52F × 0.75 thread
2	Protective window, 39 × 27 × 1.1mm, AR window for mono camera, IR-cut for color camera
3	Thermo outlet
4	Air inlet
5	Trigger(7 pin)
6	USB 3.0/ USB 2.0 port
7	DC 19V 4.74A power port, 5.5 × 2.1mm
8	Power LED indicators
9	System LED TEC LED
10	TEC LED indicators
11	Fan LED indicators

8.2.4 Packing Information for MAX Series

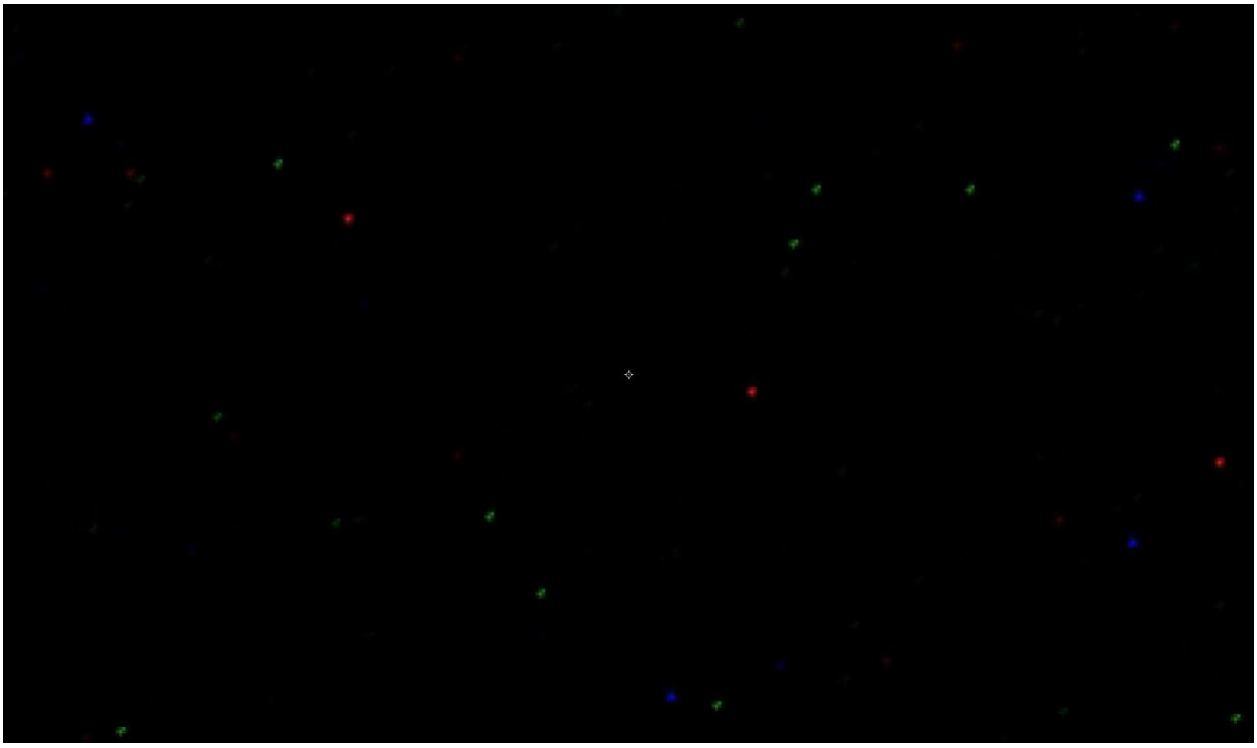
Packing Information of MAX Series(Square)

Standard Package		
A	Carton L:50cm W:30cm H:30cm (20pcs, 12~17Kg/ carton), not shown in the photo(TBD)	
B	3-A safety equipment case: L:28cm W:23cm H:15cm (1pcs, 2.8Kg/ box); Carton size: L:28.2cm W:25.2cm H:16.7cm(TBD)	
C	One MAX series camera	
D	Power adapter: input: AC 100~240V 50Hz/60Hz, output: DC19 V 4A	
E	High-Speed USB3.0 A male to B male gold-plated connectors cable /1.5m	
F	IO cable	
G	CD (Driver & utilities software, Ø12cm)	
L	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)

8.2.5 Sample Photos Captured with MAX Series (TBD)



Hot noise for the MAX at Gain 20 , 600 second, 15 Centidegree



Hot noise for the MAX Gain 20 , 600 second, minus 15 Centidegree

8.3 MTR3CMOS Series TE-Cooling C-mount USB3.0 CMOS Camera (21)

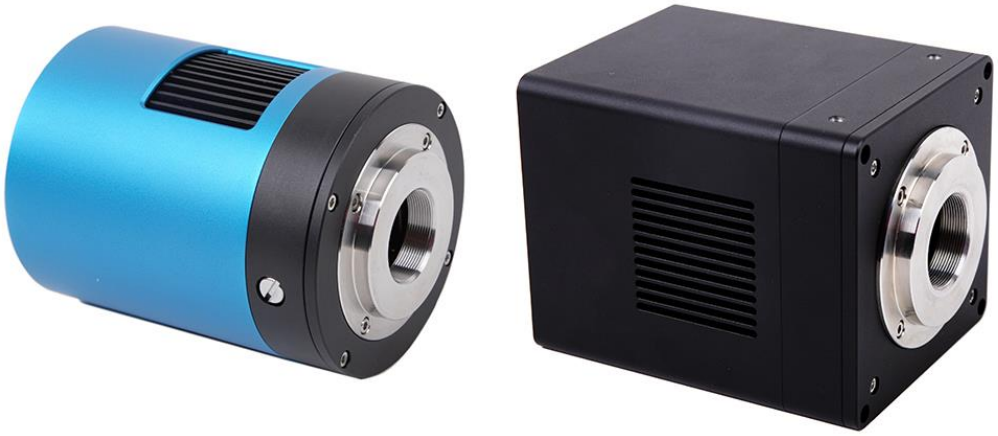
8.3.1 The Basic Characteristic of MTR3CMOS Series

MTR3CMOS series camera adopts SONY Exmor CMOS sensor as the image-picking device and USB3.0 is used as the transfer interface to increase the frame rate.

With the two-stage peltier cooling sensor chip to -42 degree below ambient temperature. This will greatly increase the signal to noise ratio and decrease the image noise. Smart structure is designed to assure the heat radiation efficiency and avoid the moisture problem. Electric fan is used to increase the heat radiation speed.

MTR3CMOS series comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/Linux/OSX multiple platform SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

The MTR3CMOS series can be widely used in low light environment and microscope fluorescence image capture and analysis, as well as the astronomy deep sky application.



MTR3CMOS Series (Cylinder or Square Housing)

The basic characteristic of MTR3CMOS series can be summarized as follows:

- Standard C-Mount camera with SONY Exmor CMOS sensors;
- Two-stage TE-cooling with controllable electric fan;
- Sensor chip cooling up to 42°C below ambient temperature;
- Working temperature can be regulated to specified temperature in 5 minutes;
- Smart structure to assure the heat radiation efficiency and avoid the moisture problem;
- IR-CUT/AR coated windows;
- Up to 1-hour long time exposure;
- USB3.0 5Gbit/second interface ensuring high speed data transmission;
- Ultra-Fine color engine with perfect color reproduction capability;
- With advanced video & image processing application ToupView/ToupLite;
- Support both video and trigger modes;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain control API;

8.3.2 MTR3CMOS Series Datasheet (21)

Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution ADC	Binning	Exposure
MTR3CMOS45000KMA MTRM145000A	45M/IMX492(M, RS) 4/3"(19.11x13.00)	2.315 x2.315	351mV with 1/30s 0.12mV with 1/30s	8.1@8176x5616 30.0@4080x2808 8.1@7408x5556 33.0@3696x2778 10.4@8176x4320 34.7@4096x2160 62.5@2048x1080 86.5@1360x720 8 Bit / 12 Bit	1x1(3:2) 2x2(3:2) 1x1(4:3) 2x2(4:3) 1x1(17:9) 2x2(17:9) 3x3(17:9) 4x4(17:9	0.1ms~1h
MTR3CMOS26000KPA MTRP126000A	26M/IMX571(C, RS) 1.8"(23.48x15.67) APS-C	3.76 x3.76	485mv with 1/30s 0.07mv with 1/30s	14@6224x4168 37@3104x2084 110@2064x1386 8 Bit / 16 Bit	1x1 2x2 3x3	0.1ms~1h
MTR3CMOS26000KMA MTRM126000A	26M/IMX571(M, RS) 1.8 "(23.48x15.67) APS-C	3.76 x3.76	871mv with 1/30s 0.07mv with 1/30s	14@6224x4168 37@3104x2084 110@2064x1386 8 Bit / 16 Bit	1x1 2x2 3x3	0.1ms~1h
MTR3CMOS21000KPA MTRP121000A	21M/IMX269(C) 4/3"(17.4x13.1)	3.3 x3.3	400mv with 1/30s 0.1mv with 1/30s	17@5280x3954 17@3952x3952 56@2640x1976 67@1760x1316 192@584x438 8 Bit / 12 Bit	1x1 1x1 2x2 3x3 9x9	0.1ms~1h
MTR3CMOS20000KPA MTRP120000A	20M/IMX183(C, RS) 1 "(13.056x8.755)	2.4 x2.4	462mv with 1/30s 0.21mv with 1/30s	19@5440x3648 48.8@2736x1824 59.4@1824x1216 8 Bit / 12 Bit	1x1 2x2 3x3	0.1ms~1h
MTR3CMOS20000KMA MTRM120000A	20M/IMX183(M, RS) 1 "(13.056x8.755)	2.4 x2.4	388mv with 1/30s 0.21mv with 1/30s (F8.0)	19@5440x3648 48.8@2736x1824 59.4@1824x1216 8 Bit / 12 Bit	1x1 2x2 3x3	0.1ms~1h
MTR3CMOS16000KPA MTRP116000A	16M/MN34230PLJ(C) 4/3" (17.6x13.3)	3.8x3.8	2413LSB 89.1LSB (Gain = 0dB)	6@4640x3506 20@2304x1750 48.0@1536x1160 8 Bit / 12 Bit	1x1 2x2 3x3	0.15ms~1h
MTR3CMOS16000KMA MTRM116000A	16M/MN34230ALJ(M) 4/3" (17.6x13.3)	3.8x3.8	2650LSB 89.1LSB (Gain = 0dB)	22.5@4648x3506 43.0@2304x1750 48.0@1536x1168 8 Bit / 12 Bit	1x1 2x2 3x3	0.15ms~1h
MTR3CMOS10300KPA MTRP110300A	10.3M/IMX294(C) 4/3 "(19.11x13.0)	4.63 x4.63	419mv with 1/30s 0.12mv with 1/30s	30.0@4128x2808 38.5 @4096x2160 59.8@2048x1080 87.2@1360x720 8 Bit / 14 Bit	1x1 1x1 2x2 3x3	0.15ms~1h
MTR3CMOS10300KMA MTRM110300A	10.3M/IMX492(M, RS) 4/3 "(19.11x13.0)	4.63 x4.63	701mv with 1/30s 0.12mv with 1/30s	30.0@4128*2808 38.5@ 4096*2160 59.8@2048*1080 87.2@1360*720 8 Bit / 14 Bit	1x1 1x1 2x2 3x3	0.15ms~1h
MTR3CMOS09000KPA MTRP109000A	9M/IMX533(C) 1"(11.28x11.28)	3.76 x3.76	534mv with 1/30s 0.04mv with 1/30s	40@2992x3000 62@1488x1500 186@992x998 8 Bit / 14 Bit	1x1 2x2 3x3	0.1ms~1h
MTR3CMOS09000KMA MTRM109000A(2023,New)	9M/IMX533(M) 1"(11.28x11.28)	3.76 x3.76	877mv with 1/30s 0.04mv with 1/30s	40@2992x3000 62@1488x1500 186@992x998 8 Bit / 14 Bit	1x1 2x2 3x3	0.1ms~1h
MTR3CMOS08300KPA MTRP108300A	8.3M/IMX585(C, RS) 1/1.2"(11.14x6.26)	2.9x2.9	5970mv with 1/30s 0.15mv with 1/30s	45@3840x2160 70@1920x1080 8 Bit / 12 Bit	1x1 2x2	0.1ms~1h
MTR3CMOS07100KPA MTRP107100A	7.0M/IMX428(C，GS) 1.1 "(14.4x9.9)	4.5 x4.5	2058mv with 1/30s 0.15mv with 1/30s	51.3@3200x2200 133.8@1584x1100 8 Bit / 12 Bit	1x1 1x1	0.1ms~1h
MTR3CMOS07100KMA MTRM107100A	7.0M/IMX428(M，GS) 1.1 "(14.4x9.9)	4.5 x4.5	3354mv with 1/30s 0.15mv with 1/30s	51.3@3200x2200 133.8@1584x1100 8 Bit / 12 Bit	1x1 1x1	0.1ms~1h
MTR3CMOS02300KPA MTRP102300A 20231030	2.3M/SC2110(C,RS) 1.69"(23.0x14.4)	12x12	120000 mV/lux·s @HCG	120@1920x1200 8 Bit / 12 Bit	1x1	0.1ms~1h
MTR3CMOS02300KMA MTRM102300A 20231030	2.3M/SC2110(M,RS) 1.69"(23.0x14.4)	12x12	120000 mV/lux·s @HCG	120@1920x1200 8 Bit / 12 Bit	1x1	0.1ms~1h
MTR3CMOS01700KPA	1.7M/IMX432(C，GS)	9.0 x9.0	4910mv with 1/30s	98.6@1600x1100	1x1	0.1ms~1h

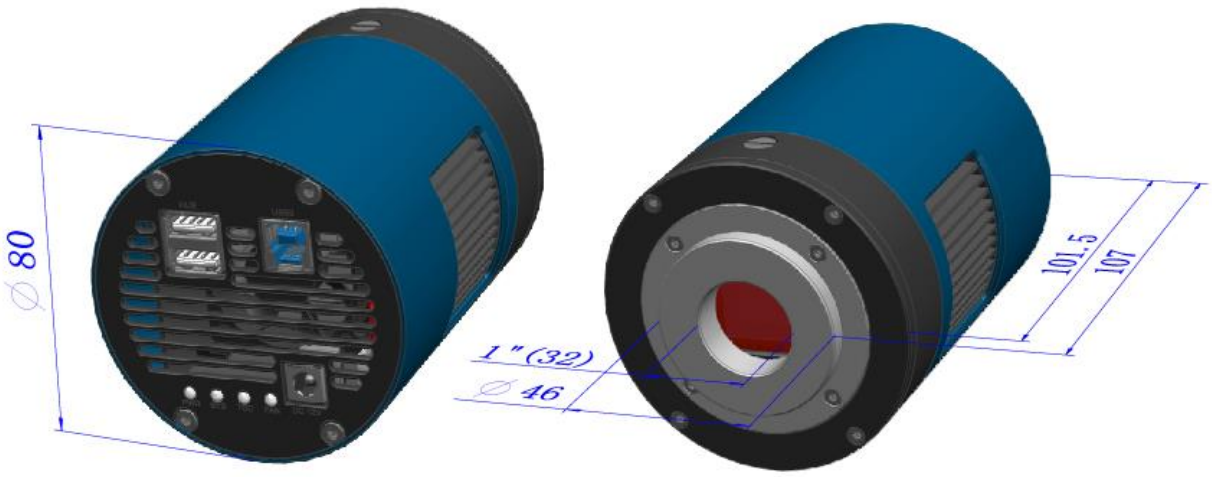
MTRP101700A	1.1 “(14.4x9.9)		0.3mv with 1/30s	8 Bit / 12 Bit		
MTR3CMOS01700KMA MTRM101700A	1.7M/IMX432(M，GS) 1.1 “(14.4x9.9)	9.0 x9.0	8100mv with 1/30s 0.3mv with 1/30s	98.6@1600x1100 8 Bit / 12 Bit	1x1	0.1ms~1h
MTR3CMOS01300KMA MTRM101300A	1.3M/GLUX9701BSI(M，UV, RS) 1 “(12.493x9.994)	9.76 x9.76	$2.57x10^8$(e-/((W/m2).s)) QE89%@610nm 0.08(e-/s/pix) @-28C	30fps@1280×1024 30fps@640×512 8 Bit / HDR 16 Bit	1x1 2x2	0.1ms~1h
MTR3CMOS00500KMA MTRM100500A	0.5M/GLUX1605BSI(M，UV, RS) 1 “(12.8x9.6)	16.0 x16.0	$6.4x10^8$(e-/((W/m2).s)) QE91%@550nm 50(e-/s/pix)	60.0@800x600 60.0@400x300 8 Bit / HDR 16 Bit	1x1 2x2	0.1ms~1h

C:Color; M:Monochrome;

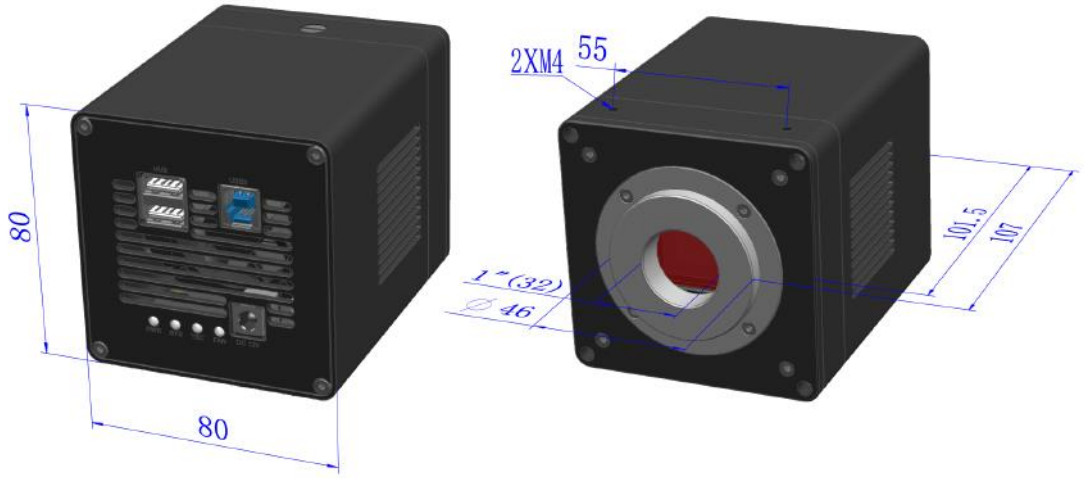
Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine/NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
Recording System	Still Picture and Movie
Cooling System*	Two-stage TE-cooling System -45 °C below Camera Body Temperature
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port External Power Adapter for Cooling System, DC12V, 3A
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB3.0 High-speed Port
	Display:17” or Larger
	CD-ROM

8.3.3 Dimension of MTR3CMOS Series

The MTR3CMOS series body, made from tough, alloy with CNC technique, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT or AR to block the IR light or protect the camera sensor. The fan‘s vibration is minimized to the low level to eliminate the vibration caused imaging blur. This design ensures a rugged, robust solution with an increased lifespan when compared to the other industrial camera solutions.



Dimension of MTR3CMOS (Cylinder) Series



Dimension of MTR3CMOS (Square) Series

8.3.4 Packing Information for MTR3CMOS Series

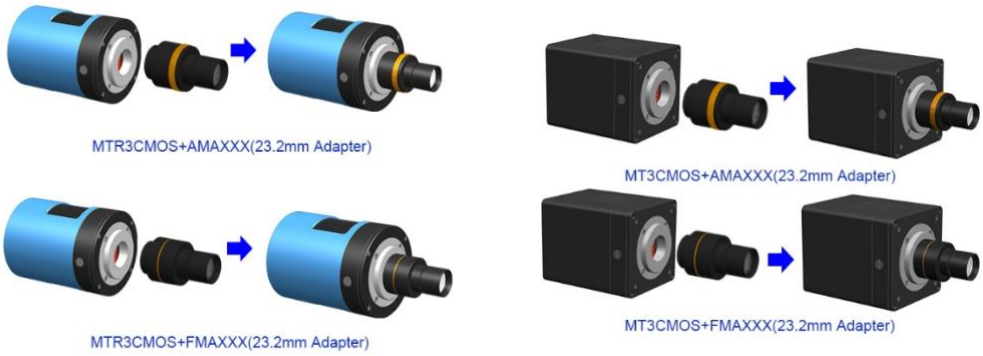
Packing Information of MTR3CMOS Series(Cylinder)

Packing Information of MTR3CMOS Series(Square)

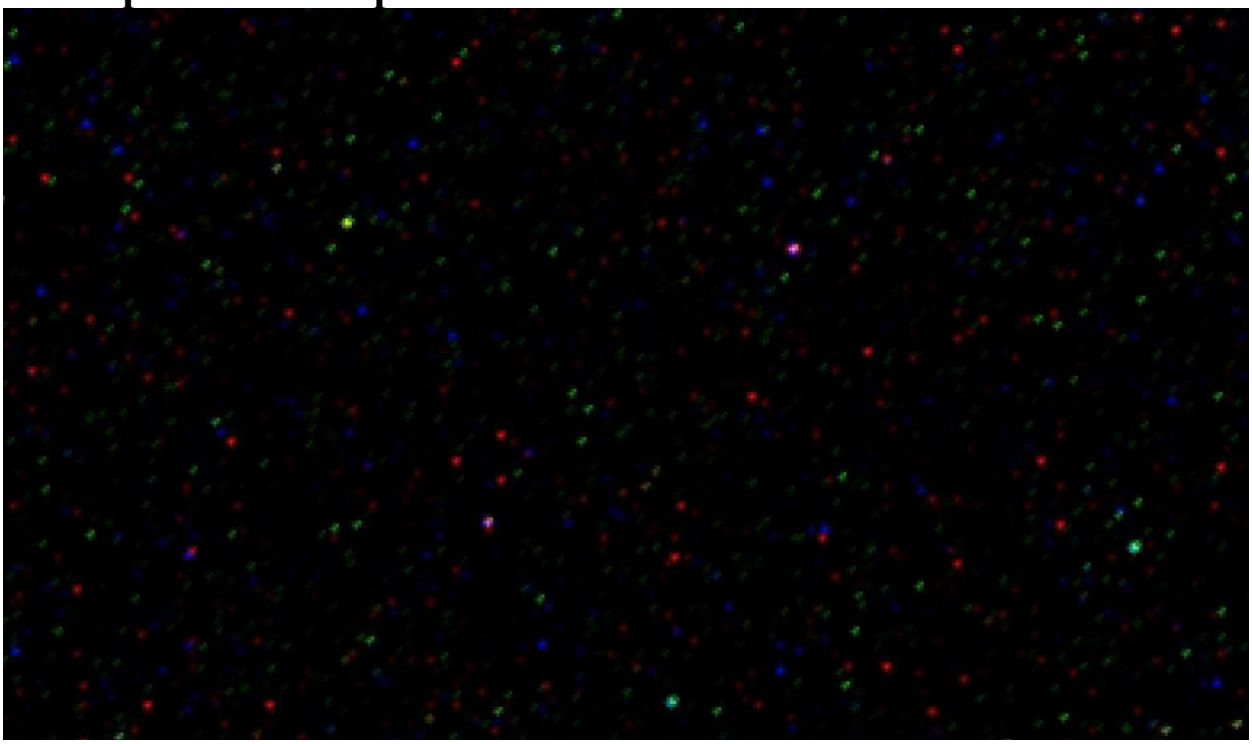
	Standard Package
A	Carton L:50cm W:30cm H:30cm (20pcs, 12~17Kg/ carton), not shown in the photo(TBD)
B	3-A safety equipment case: L:28cm W:23cm H:15cm (1pcs, 2.8Kg/ box); Carton size:L:28.2cm W:25.2cm H:16.7cm(TBD)
C	One MTR3CMOS series camera(C-mount)
D	Drying tube and desiccant
E	Power adapter: input: AC 100~240V 50Hz/60Hz, output: DC12 V 3A
F	High-Speed USB3.0 A male to B male gold-plated connectors cable /1.5m
G	CD (Driver & utilities software, Ø12cm)

Optional Accessory			
H	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075 108004/AMA100
		C-Mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075 108011/ATA100
I	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075 108008/FMA100
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075 108014/FTA100
Note: For H and I optional items, please specify your camera type(C-mount, microscope camera or telescope camera), ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
J	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
K	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
L	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

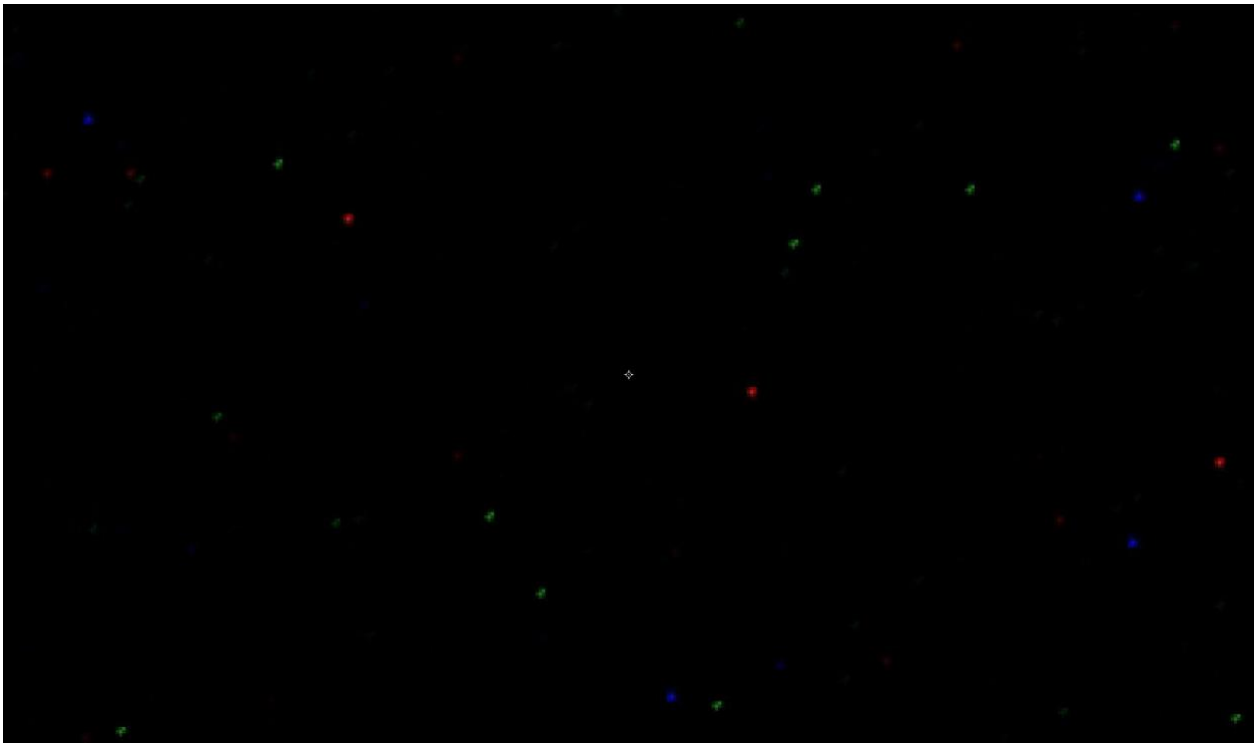
8.3.5 Extension of MTR3CMOS Series with Microscope Adapter

Extension	Picture	
C-mount Camera		Machine vision; Medical imaging; Semiconductor equipment; Test instruments; Document scanners; 2D barcode readers; Web camera and security video; Microscope imaging;
Microscope Camera		

8.3.6 Sample Photos Captured with MTR3CMOS Series



Hot noise for the MTR3CMOS at Gain 20 , 600 second, 15 Centidegree



Hot noise for the MTR3CMOS Gain 20, 600 second, minus 15 Centidegree

8.4 ITR3CMOS Series TE-Cooling C-mount USB3.0 CMOS Camera with Trigger Function (17)

8.4.1 The Basic Characteristic of ITR3CMOS Series

ITR3CMOS series camera adopts SONY Exmor CMOS sensor as the image-picking device and USB3.0 is used as the transfer interface to increase the frame rate.

With the two-stage peltier cooling sensor chip to 40 degree below ambient temperature. This will greatly increase the signal to noise ratio and decrease the image noise. Smart structure is designed to assure the heat radiation efficiency and avoid the moisture problem. Electric fan is used to increase the heat radiation speed.

ITR3CMOS series comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/Linux/OSX multiple platform SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

The ITR3CMOS series can be widely used in low light environment and microscope fluorescence image capture and analysis, as well as the astronomy deep sky application.

ITR3CMOS Series (Square Housing)

The basic characteristic of MTR3CMOS series can be summarized as follows:

- Standard C-Mount camera with SONY Exmor CMOS sensors;
- Two-stage TE-cooling with controllable electric fan;
- Sensor chip cooling up to 40°C below ambient temperature;
- Smart structure to assure the heat radiation efficiency and avoid the moisture problem;
- IR-CUT/AR coated windows;
- Up to 1-hour long time exposure;
- USB3.0 5Gbit/second interface ensuring high speed data transmission;
- Embedded up to 16bit hardware ISP module;
- Support the capture of video and image in software / hardware trigger mode
- Ultra-Fine color engine with perfect color reproduction capability;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;

8.4.2 ITR3CMOS Series Datasheet(17, 2023)

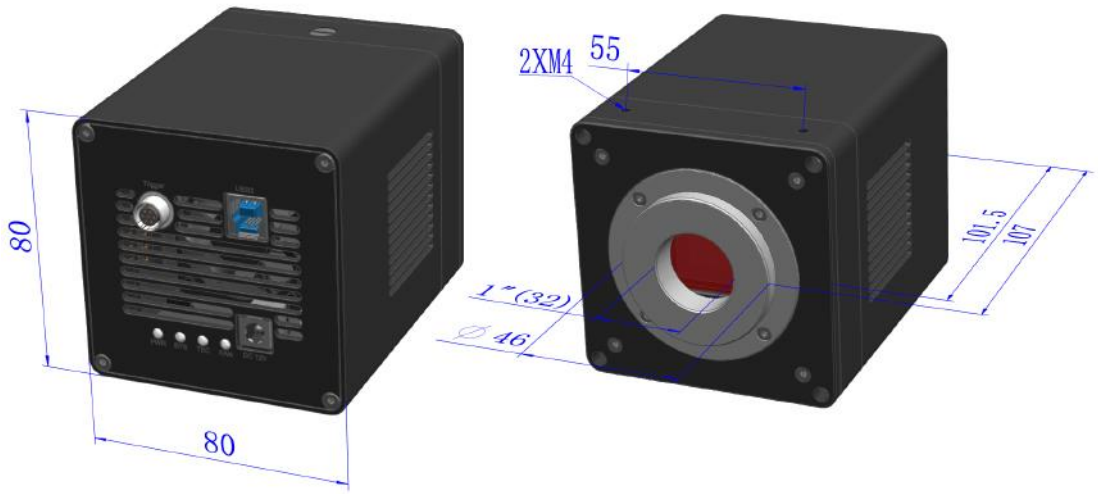
Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution ADC	Binning	Exposure
ITR3CMOS45000KMA ITRM145000A	45M/IMX492(M,RS) 4/3"(19.11x13.00)	2.315x2.315	351mV with 1/30s 0.12mV with 1/30s	8.1@8176x5616 30.0@4080x2808 8.1@7408x5556 33.0@3696x2778 10.4@8176x4320 34.7@4096x2160 62.5@2048x1080 86.5@1360x720 8 Bit / 12 Bit	1x1(3:2) 2x2(3:2) 1x1(4:3) 2x2(4:3) 1x1(17:9) 2x2(17:9) 3x3(17:9) 4x4(17:9	0.1ms~1h
ITR3CMOS26000KPA ITRP126000A	26M/IMX571(C,RS) 1.8"(23.48x15.67) APS-C	3.76x3.76	485mv with 1/30s 0.07mv with 1/30s	14@6224x4168 37@3104x2084 110@2064x1386 8 Bit / 16 Bit	1x1 2x2 3x3	0.1ms~1h
ITR3CMOS26000KMA ITRM126000A	26M/IMX571(M,RS) 1.8 "(23.48x15.67) APS-C	3.76x3.76	871mv with 1/30s 0.07mv with 1/30s	14@6224x4168 37@3104x2084 110@2064x1386 8 Bit / 16 Bit	1x1 2x2 3x3	0.1ms~1h
ITR3CMOS21000KPA ITRP121000A	21M/IMX269(C) 4/3"(17.4x13.1)	3.3 x3.3	400mv with 1/30s 0.1mv with 1/30s	17@5280x3954 17@3952x3952 56@2640x1976 67@1760x1316 192@584x438 8 Bit / 12 Bit	1x1 1x1 2x2 3x3 9x9	0.1ms~1h
ITR3CMOS20000KPA ITRP120000A	20M/IMX183(C,RS) 1 "(13.056x8.755)	2.4 x2.4	462mv with 1/30s 0.21mv with 1/30s	19@5440x3648 48.8@2736x1824 59.4@1824x1216 8 Bit / 12 Bit	1x1 2x2 3x3	0.1ms~1h
ITR3CMOS20000KMA ITRM120000A	20M/IMX183(M,RS) 1 "(13.056x8.755)	2.4 x2.4	388mv with 1/30s 0.21mv with 1/30s (F8.0)	19@5440x3648 48.8@2736x1824 59.4@1824x1216 8 Bit / 12 Bit	1x1 2x2 3x3	0.1ms~1h
ITR3CMOS10300KPA ITRP110300A	10.3M/IMX294(C) 4/3 "(19.11x13.0)	4.63x4.63	419mv with 1/30s 0.12mv with 1/30s	30.0@4128x2808 38.5 @4096x2160 59.8@2048x1080 87.2@1360x720 8 Bit / 14 Bit	1x1 1x1 2x2 3x3	0.15ms~1h
ITR3CMOS10300KMA ITRM110300A	10.3M/IMX492(M,RS) 4/3 "(19.11x13.0)	4.63x4.63	701mv with 1/30s 0.12mv with 1/30s	30.0@4128*2808 38.5@ 4096*2160 59.8@2048*1080 87.2@1360*720 8 Bit / 14 Bit	1x1 1x1 2x2 3x3	0.15ms~1h
ITR3CMOS09000KPA ITRP109000A	9M/IMX533(C) 1"(11.28x11.28)	3.76x3.76	534mv with 1/30s 0.04mv with 1/30s	40@2992x3000 62@1488x1500 186@992x998 8 Bit / 14 Bit	1x1 2x2 3x3	0.1ms~1h
ITR3CMOS09000KMA ITRM109000A	9M/IMX533(M) 1"(11.28x11.28)	3.76x3.76	877mv with 1/30s 0.04mv with 1/30s	40@2992x3000 62@1488x1500 186@992x998 8 Bit / 14 Bit	1x1 2x2 3x3	0.1ms~1h
ITR3CMOS08300KPA ITRP108300A	8.3M/IMX585(C) 1/1.2"(11.14x6.26)	2.9x2.9	5970mv with 1/30s 0.15mv with 1/30s	45@3840x2160 70@1920x1080 8 Bit / 12 Bit	1x1 2x2	0.1ms~1h
ITR3CMOS07100KPA ITRP107100A	7.0M/IMX428(C，GS) 1.1 "(14.4x9.9)	4.5 x4.5	2058mv with 1/30s 0.15mv with 1/30s	51.3@3200x2200 133.8@1584x1100 8 Bit / 12 Bit	1x1 1x1	0.1ms~1h
ITR3CMOS07100KMA ITRM107100A	7.0M/IMX428(M，GS) 1.1 "(14.4x9.9)	4.5 x4.5	3354mv with 1/30s 0.15mv with 1/30s	51.3@3200x2200 133.8@1584x1100 8 Bit / 12 Bit	1x1 1x1	0.1ms~1h
ITR3CMOS01700KPA ITRP101700A	1.7M/IMX432(C，GS) 1.1 "(14.4x9.9)	9.0 x9.0	4910mv with 1/30s 0.3mv with 1/30s	98.6@1600x1100 8 Bit / 12 Bit	1x1	0.1ms~1h
ITR3CMOS01700KMA ITRM101700A	1.7M/IMX432(M，GS) 1.1 "(14.4x9.9)	9.0 x9.0	8100mv with 1/30s 0.3mv with 1/30s	98.6@1600x1100 8 Bit / 12 Bit	1x1	0.1ms~1h
ITR3CMOS01300KMA ITRM101300A	1.3M/GLUX9701BSI(M，UV,RS) 1 "(12.493x9.994)	9.76x9.76	$2.57x10^8$(e-/((W/m2).s)) QE89%@610nm 0.08(e-/s/pix) @-28C	30fps@1280×1024 30fps@640×512 8 Bit / HDR 16 Bit	1x1 2x2	0.1ms~1h
ITR3CMOS00500KMA ITRM100500A	0.5M/GLUX1605BSI(M，UV,RS) 1 "(12.8x9.6)	16.0x16.0	$6.4x10^8$e-/((W/m2).s)) QE91%@550nm 50(e-/s/pix)	60.0@800x600 60.0@400x300 8 Bit / HDR 16 Bit	1x1 2x2	0.1ms~1h

C:Color; M:Monochrome;

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine/NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
Recording System	Still Picture and Movie
Cooling System*	Two-stage TE-cooling System -45 °C below Camera Body Temperature
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port External Power Adapter for Cooling System, DC12V, 3A
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB3.0 High-speed Port
	Display:17" or Larger
	CD-ROM

8.4.3 Dimension of ITR3CMOS Series

The ITR3CMOS series body, made from tough, alloy with CNC technique, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT or AR to block the IR light or protect the camera sensor. The fan's vibration is minimized to the low level to eliminate the vibration caused imaging blur. This design ensures a rugged, robust solution with an increased lifespan when compared to the other industrial camera solutions.



Dimension of ITR3CMOS Series

8.4.4 Packing Information for ITR3CMOS Series

Packing Information of ITR3CMOS Series

Standard Package			
A	Carton L:50cm W:30cm H:30cm (20pcs, 12~17Kg/ carton), not shown in the photo(TBD)		
B	3-A safety equipment case: L:28cm W:23cm H:15cm (1pcs, 2.8Kg/ box); Carton size:L:28.2cm W:25.2cm H:16.7cm(TBD)		
C	One ITR3CMOS series camera(C-mount)		
D	Drying tube and desiccant		
E	Power adapter: input: AC 100~240V 50Hz/60Hz, output: DC12 V 3A		
F	High-Speed USB3.0 A male to B male gold-plated connectors cable /1.5m		
G	IO cable		
H	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
I	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075 108004/AMA100
		C-Mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075 108011/ATA100
J	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075 108008/FMA100
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075 108014/FTA100
Note: For H and I optional items, please specify your camera type(C-mount, microscope camera or telescope camera), ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
L	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
K	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
M	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

8.5 CTR3CMOS Series TE-Cooling C-mount USB3.0/GigE CMOS Camera(15)

8.5.1 The Basic Characteristic of CTR3CMOS Series

CTR3CMOS series camera adopts SONY Exmor CMOS sensor as the image-picking device and USB3.0/GigE is used as the transfer interface to increase the frame rate.

With the peltier cooling sensor chip to 5-10 degree below ambient temperature. This will greatly increase the signal to noise ratio and decrease the image noise. Smart structure is designed to assure the heat radiation efficiency and avoid the moisture problem. Electric fan is used to increase the heat radiation speed.

CTR3CMOS series comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/Linux/OSX multiple platform SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

The CTR3CMOS series can be widely used in low light environment and microscope fluorescence image capture and analysis, as well as the astronomy deep sky application.

CTR3CMOS Series Camera

The basic characteristic of CTR3CMOS series can be summarized as follows:

- Standard C-Mount camera with SONY Exmor CMOS sensors;
- TE-cooling with controllable electric fan;
- Sensor chip cooling up to 5~10°C below ambient temperature;
- Working temperature can be regulated to specified temperature in 5 minutes;
- Smart structure to assure the heat radiation efficiency and avoid the moisture problem;
- Up to 5-minutes long time exposure;
- USB3.0 5Gbit/second/ GigE **1000Mb/s** interface ensuring high speed data transmission;
- Support capture image with video /trigger mode;
- Support external IO synchronization trigger mode;
- Ultra-Fine color engine with perfect color reproduction capability;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain control API;

8.5.2 CTR3CMOS Series Datasheet(15)

Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution ADC	Binning	Exposure
CTR3CMOS00390KMA CTRM100390A	0.39M/IMX287(M,GS) 1/2.9"(4.97x3.73)	6.9 x6.9	7320mV with 1/30s 0.76mV with 1/30s	20fps@720x540 8 Bit / 12 Bit	1x1	6us~300s
CTR3CMOS00503KMA CTRM100503A	0.5M/IMX426(M,GS) 1/1.7"(7.2x5.58)	9.0 x9.0	8100mV with 1/30s 0.3mV with 1/30s	20fps@800x620 8 Bit / 12 Bit	1x1	6us~300s
CTR3CMOS01700KPA CTRP101700A	1.7M/IMX432(C，GS) 1.1 "(14.4x9.9)	9.0 x9.0	4910mv with 1/30s 0.3mv with 1/30s	98.6fps@1600×1100 8 Bit / 12 Bit	1x1	6us~300s
CTR3CMOS01700KMA CTRM101700A	1.7M/IMX432(M，GS) 1.1 "(14.4x9.9)	9.0 x9.0	8100mv with 1/30s 0.3mv with 1/30s	98.6fps@1600×1100 8 Bit / 12 Bit	1x1	6us~300s
CTR3CMOS07100KPA CTRP107100A	7.0M/IMX428(C，GS) 1.1 "(14.4x9.9)	4.5 x4.5	2058mv with 1/30s 0.15mv with 1/30s	51.3fps@3200×2200 133.8fps@1584×1100 8 Bit / 12 Bit	1x1 1x1	6us~300s
CTR3CMOS07100KMA CTRM107100A	7.0M/IMX428(M，GS) 1.1 "(14.4x9.9)	4.5 x4.5	3354mv with 1/30s 0.15mv with 1/30s	51.3fps@3200×2200 133.8fps@1584×1100 8 Bit / 12 Bit	1x1 1x1	6us~300s
CTR3CMOS20000KPA CTRP120000A	20M/IMX183(C,RS) 1 "(13.056x8.755)	2.4 x2.4	462mv with 1/30s 0.21mv with 1/30s	19.0@5440x3648 48.8@2736x1824 59.4@1824x1216 8 Bit / 12 Bit	1x1 2x2 3x3	53us~300s
CTR3CMOS20000KMA CTRM120000A	20M/IMX183(M,RS) 1 "(13.056x8.755)	2.4 x2.4	776mv with 1/30s 0.21mv with 1/30s	19.0@5440x3648 48.8@2736x1824 59.4@1824x1216 8 Bit / 12 Bit	1x1 2x2 3x3	53us~300s
CTR3CMOS45000KMA CTRM145000A	45M/IMX492(M,RS) 4/3"(19.11x13.00)	2.315x2.31 5	351mV with 1/30s 0.12mV with 1/30s	8.1@8176x5616 30.0@4080x2808 8.1@7408x5556 33.0@3696x2778 10.4@8176x4320 34.7@4096x2160 62.5@2048x1080 86.5@1360x720 8 Bit / 12 Bit	1x1(3:2) 2x2(3:2) 1x1(4:3) 2x2(4:3) 1x1(17:9) 2x2(17:9) 3x3(17:9) 4x4(17:9)	0.1ms~300s
CTR3CMOS01700KPA-G 20231018	1.7M/IMX432(C,GS) 1.1 "(14.4x9.9)	9.0 x9.0	4910mv with 1/30s 0.3mv with 1/30s	66fps@1600×1100 8 Bit / 12 Bit	1x1	6us~300s
CTR3CMOS01700KMA-G 20231018	1.7M/IMX432(M,GS) 1.1 "(14.4x9.9)	9.0 x9.0	8100mv with 1/30s 0.3mv with 1/30s	66fps@1600×1100 8 Bit / 12 Bit	1x1	6us~300s
CTR3CMOS07100KPA-G 20231018	7.0M/IMX428(C,GS) 1.1 "(14.4x9.9)	4.5 x4.5	2058mv with 1/30s 0.15mv with 1/30s	16.4fps@3200×2200 66fps@1600×1100 8 Bit / 12 Bit	1x1 1x1	6us~300s
CTR3CMOS07100KMA-G 20231018	7.0M/IMX428(M,GS) 1.1 "(14.4x9.9)	4.5 x4.5	3354mv with 1/30s 0.15mv with 1/30s	16.4fps@3200×2200 66fps@1600×1100 8 Bit / 12 Bit	1x1 1x1	6us~300s
CTR3CMOS20000KPA-G 20231018	20M/IMX183(C,RS) 1 "(13.056x8.755)	2.4 x2.4	462mv with 1/30s 0.21mv with 1/30s	4.5@5440x3648 18.5@2736x1824 41.7@1824x1216 8 Bit / 12 Bit	1x1 2x2 3x3	53us~300s
CTR3CMOS20000KMA-G 20231018	20M/IMX183(M,RS) 1 "(13.056x8.755)	2.4 x2.4	776mv with 1/30s 0.21mv with 1/30s	4.5@5440x3648 18.5@2736x1824 41.7@1824x1216 8 Bit / 12 Bit	1x1 2x2 3x3	53us~300s

C:Color; M:Monochrome;G:GigE

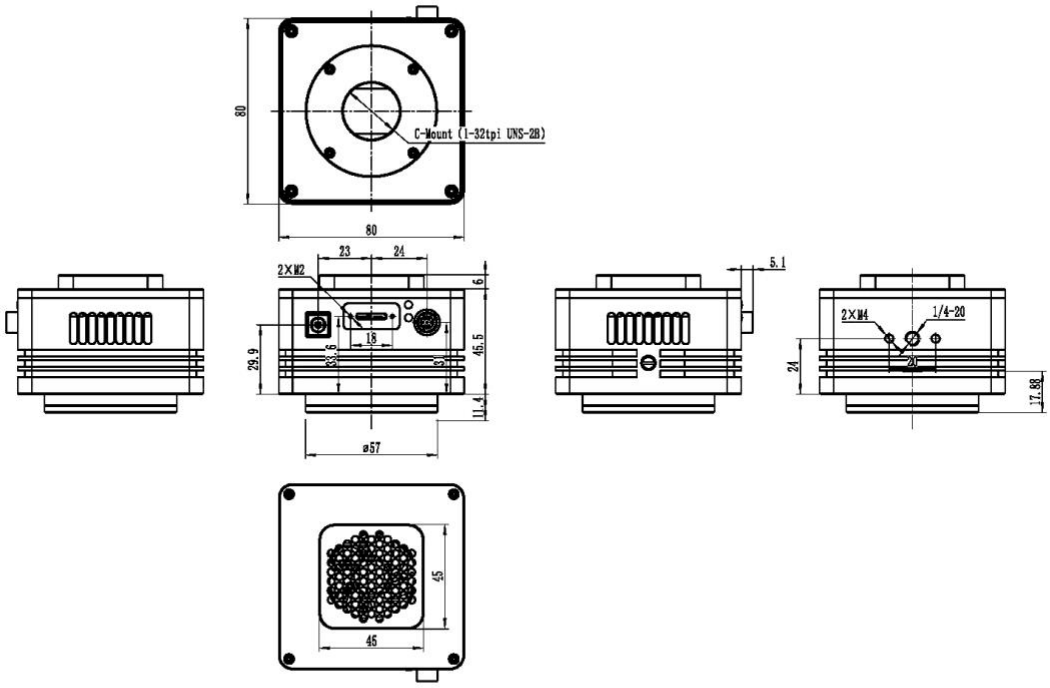
Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine/NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
Recording System	Still Picture and Movie
Cooling System*	Two-stage TE-cooling System 25 °C below Camera Body Temperature
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH

Power Supply	External Power Adapter for camera and cooling system, DC12V, 3A
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB3.0 High-speed Port
	Display:17” or Larger
	CD-ROM

8.5.3 Dimension of CTR3CMOS Series

The CTR3CMOS series body, made from tough, alloy with CNC technique, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT or AR to block the IR light or protect the camera sensor. The fan‘s vibration is minimized to the low level to eliminate the vibration caused imaging blur. This design ensures a rugged, robust solution with an increased lifespan when compared to the other industrial camera solutions.

Dimension of CTR3CMOS Series



Dimension of CTR3CMOS Series

8.5.4 Packing Information for CTR3CMOS Series(USB)

Packing Information of CTR3CMOS Series

Standard Package			
A	Carton L:50cm W:30cm H:30cm (20pcs, 12~17Kg/ carton), not shown in the photo(TBD)		
B	B1: L:20.4cm W:20.4.0cm H:10cm (1pcs, 1.04kg/ box) B2:3-A safety equipment case: L:28cm W:23cm H:15cm (1pcs, 2.1Kg/ box); Carton size:L:28.2cm W:25.2cm H:16.7cm(TBD)		
C	One CTR3CMOS series camera(C-mount)		
D	With National standard, American Standard, European standard, and British standard power lines respectively(Optional)		
E	Power adapter: input: AC 100~240V 50Hz/60Hz, output: DC12 V 3A		
F	High-Speed USB3.0 A male to B male gold-plated connectors cable /3m		
G	One external trigger control cable		
H	USB flash driver (Driver & utilities software)		
Optional Accessory（Not shown in the Photo）			
I	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075 108004/AMA100
		C-Mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075 108011/ATA100
J	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075 108008/FMA100
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075 108014/FTA100
Note: For I and J optional items, please specify your camera type(C-mount, microscope camera or telescope camera), ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
K	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
L	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
M	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

8.5.5 Packing Information for CTR3CMOS Series Camera(GigE)

Standard Packaging List	
A	External box for B(not shown in this figure) Carton size: L:28.2cm W:25.2cm H:16.7cm
B	3-A safety equipment case: L:28cm W:23cm H:15.5cm (1pcs, 2.8Kg/ box)
C	One CTR3CMOS series GigE camera
D	Power cord. National standard, American standard, European standard, British standard power cord (D1, D2, D3, D4) for choosing
E	Power adapter: Input: AC 100~240V 50Hz/60Hz, Output: DC 12V 3A
F	One external trigger control cable
G	GigE cable: G1:3m G2:5m G3:10m(G4：50m not shown in this figure)
H	USB flash disk (with driver and application software in it)

8.5.6 Extension of CTR3CMOS Series with Microscope Adapter

CTR3CMOS+AMAXXX(23.2mm Adapter)

CTR3CMOS+FMAXXX(23.2mm Adapter)

8.5.7 Sample Photos Captured with CTR3CMOS Series

Hot noise for the CTR3CMOS at Gain 20 , 300 second, 15 Centidegree

Hot noise for the CTR3CMOS Gain 20 , 300 second, minus 15 Centidegree

9 Microscope USB3.0 CMOS Camera

9.1 BigEye Series M42 and M42 to C or F Mount USB3.0 CMOS Camera (8)

9.1.1 The Basic Characteristic of BigEye Series

- Large scientific CMOS sensor (SONY or GSENSE Back-illuminated CMOS sensor);
- Wide spectrum range, some models even have high response in the ultra-violet to infrared wavelength;
- Real-time 8/12bit depth switch(depending on sensor);
- Ultra-Fine HISP VP and USB3.0 5 Gbps interface ensuring high frame rates(Up to 30 frames for 10M resolution);
- Ultra-low noise and low power dissipation by using column-parallel A/D converter;
- Rolling Shutter or Global Shutter;
- Standard M42 mount, M42 to C-mount adapter or F-mount;
- CNC aluminum alloy housing;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.Net, DirectShow, Twain;

BigEye Series' Different Views

BigEye+F-mount

BigEye + F-mount+Lens

BigEye with F-mount+Lens

BigEye with F-mount and Lens

9.1.2 BigEye Series Datasheet (8)

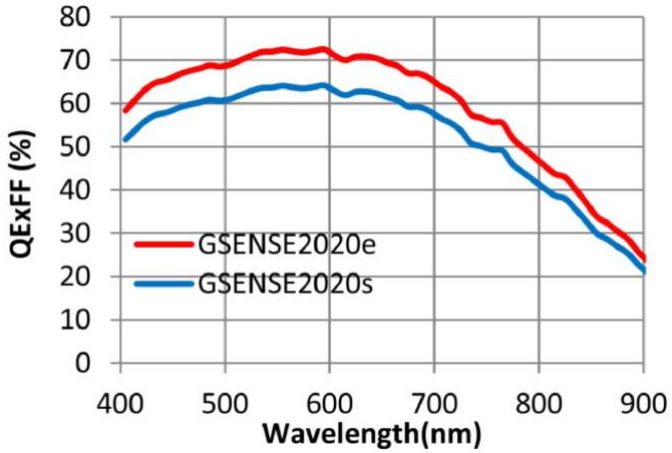
Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution ADC	Binning	Exposure
BigEye10000KPA BP910000A(New)	10.3M/IMX294(C) 4/3 “(17.47x12.86)	4.63 x4.63	419mv with 1/30s 0.12mv with 1/30s	30@3704x2778 34.5@4096x2160 39.5@2760x2072 62@2048x1080 86@1360x720 8 Bit / 12 Bit	1x1 1x1 1x1 2x2 3x3	0.1ms~15s
BigEye4200KMA BM94200A(New)	4.2M/GSENSE2020e (M,RS) 1.2”(13.31x13.31)	6.5x 6.5	$8.1x10^7$(e-/((W/m2).s)) Peak QE 72.5% @595nm 13(e-/s/pix)	45@2048x2048 45@1024 x 1022 8 Bit / 12 Bit	1x1 2x2	0.01ms~60s
BigEye4200KMB BM94200B	4.2M/GSENSE2020BSI (M,UV, RS) 1.2”(13.31x13.31)	6.5 x 6.5	$1.1x10^8$(e-/((W/m2).s)) Peak QE 93.7% @550nm 80(e-/s/pix)	22@2048 x2048 22@1024 x1024 8 Bit / 12 Bit	1x1 2x2	0.01ms~60s
BigEye4200KMC BM94200C	4.2M/GSENSE2020BSI (M,UV, RS) 1.2”(13.31x13.31)	6.5 x 6.5	$1.1x10^8$(e-/((W/m2).s)) Peak QE 93.7% @550nm 80(e-/s/pix)	44@2048x2048 44@1024x1024 44@680x680 44@512x512	1x1 2x2	0.01ms~60s
BigEye4200KMD BM94200D	4.2M/GSENSE2020BSI (M,UV, RS) 1.2”(13.31x13.31)	6.5 x 6.5	$1.1x10^8$(e-/((W/m2).s)) Peak QE 93.7% @550nm 80(e-/s/pix)	44@2048x2048 44@1024x1024 8 Bit / HDR 16 Bit	1x1 2x2	0.01ms~60s
MIPI4200KMB BM94201B	4.2M/GSENSE2020BSI (M,UV, RS) 1.2”(13.31x13.31)	6.5 x 6.5	$1.1x10^8$(e-/((W/m2).s)) Peak QE 93.7% @550nm 80(e-/s/pix)	22@2048x2046) 8 Bit / 12 Bit	1x1	0.01ms~60s
BigEye4200KME BM94200E	4.2M/GSENSE400BSI (M, UV, RS) 2.0“(22.53x22.53)	11 x 11	$3.25x10^8$(e-/((W/m2).s)) Peak QE 95.3% @560nm 345(e-/s/pix)	37@2048 x2048 37@1024 x1024 8 Bit / 12 Bit	1x1 2x2	0.01ms~60s
BigEye1300KMA BM91300A 20210610	1.3M/GLUX9701BSI (M,UV, RS) 1”(12.49x9.99)	9.76 x 9.76	$2.57x10^8$(e-/((W/m2).s)) Peak QE 89% @610nm 40(e-/s/pix)	30@1280x1024 30@640x512 8 Bit / HDR 16 Bit	1x1 2x2	0.05ms~60s

C: Color; M: Monochrome; GS: Global Shutter, UV: Good UV response

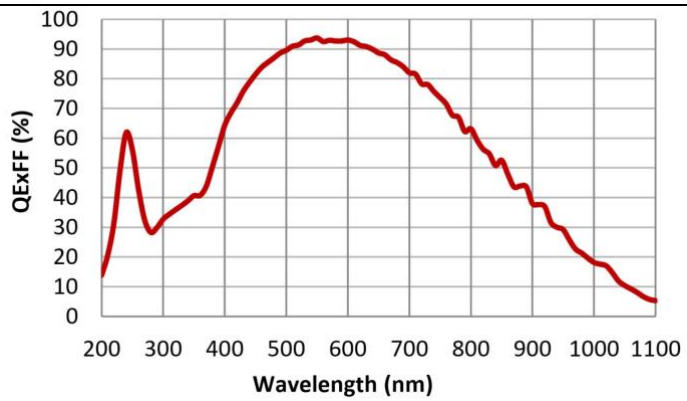
The characteristic of BigEye4200KMB，BigEye4200KMC，BigEye4200KMD and MIPI4200KMB are as follows

Order Code	Power Consumption(W)	Characteristic and Data Output Format	FPS/Resolution
BigEye4200KMB BM94200B	2.5~2.9	Support 2D denoising，hardware Auto Level（Default is not supported. The power consumption is 2.9w after upgrading），RAW12 format	22@2048 x2048(12bit) 22@1024 x1024(12bit)
BigEye4200KMC BM94200C	3.0	High frame rate，RAW12 format	44@2048 x2048(12bit) 44@1024 x1024(12bit)
BigEye4200KMD BM94200D	3.0	High frame rate and high dynamic range, Combined HDR 16bit(HG 12bit format and LG 12bitformat output，and is combined to 16bit with FPGA)	44@2048 x2048(16bit) 44@1024 x1024(16bit)
MIPI4200KMB BM94201B	TBD	MIPI D-PHY CSI-2 1Ch 4Lane(For HiSilicon and Road chip embedded system)	22@2048 x2046(12bit)

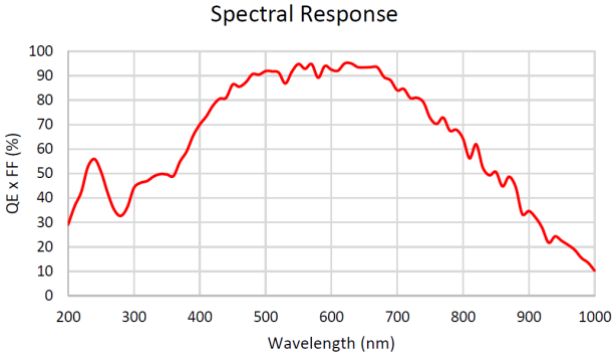
The hardware of BigEye4200KMB，BigEye4200KMC，BigEye4200KMD are the same.



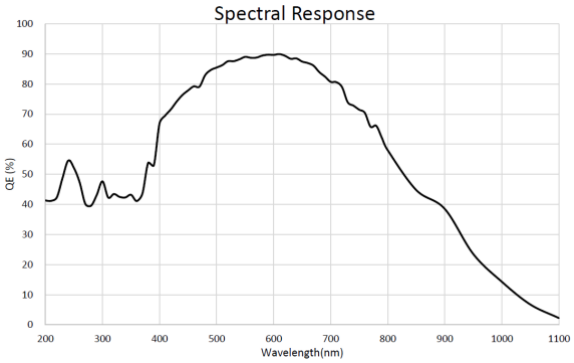
Spectral response of GSENSE2020e and GSENSE2020s



Spectral Response of GSENSE2020BSI



Spectral Response of GSENSE400BSI



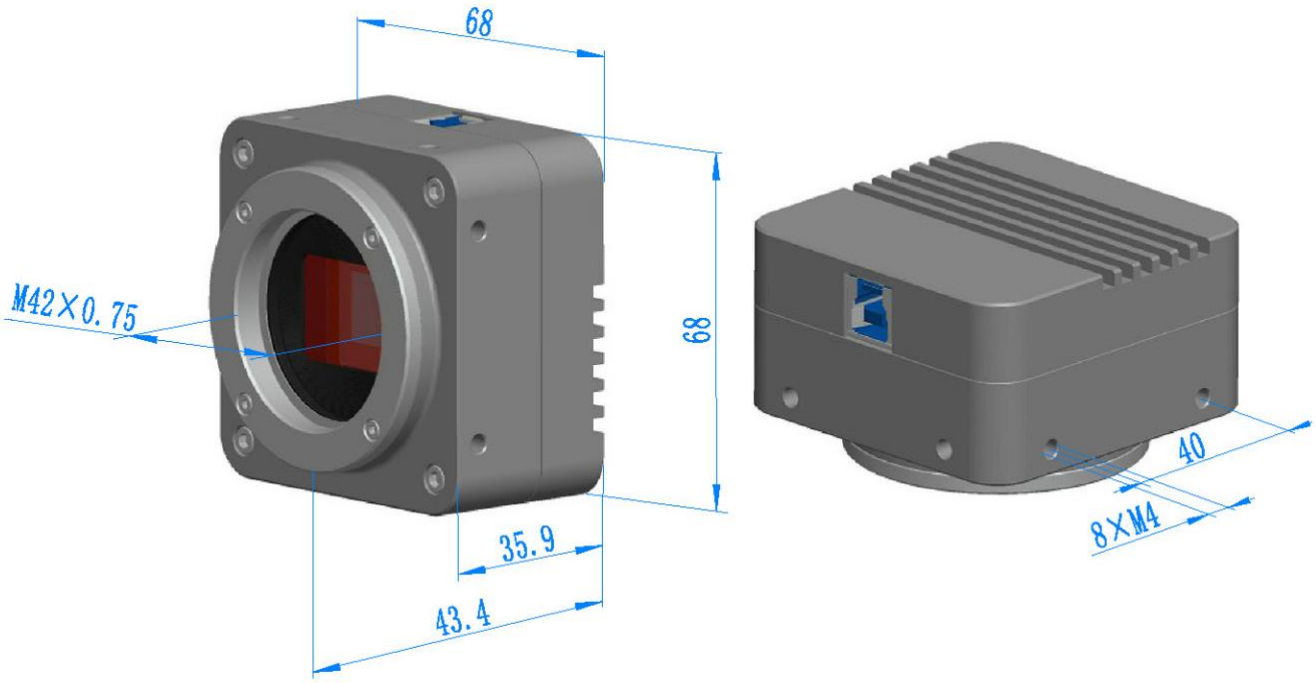
Spectral Response of GLUX9701BSI

Other Specification	
Spectral Range	200-1100nm (UV without IR-cut Filter) or 400-900nm (Upon on sensor)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine HISPVP /NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
Recording System	Still Picture and Movie
Cooling System*	Natural
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory: 2GB or More

	USB Port: USB3.0 High-speed Port
	Display: 17” or Larger
	CD-ROM

9.1.3 Dimension of BigEye Series

The BigEye series body, made from tough, CNC aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT or AR glass to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



Dimension of BigEye Serie with M42x0.75 or F-mount Interface

9.1.4 Packing Information for BigEye Series

Packing Information of BigEye Series

Standard Camera Packing List		
A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo	
B	Gift box L:15cm W:15cm H:10cm (0.58~0.6Kg/ box)	
C	One BigEye series camera	
D	High-speed USB3.0 A male to B male gold-plated connectors cable /2.0m	
E	CD (Driver & utilities software, Ø12cm)	
Optional Accessory		
F	M42x0.75mm-mount to C-mount converter (If C-mount adapter is used)	
G	M42x0.75mm-mount to F-mount converter (If F-mount lens is used)	
H	Phototube to M42x0.75 mount adapter (U-TV1.2XT2) for Olympus microscope	
I	Phototube to M42x0.75 mount adapter (MQD42120 MBB42120) for Nikon microscope	
J	Phototube to M42x0.75 mount adapter (P95-T2 4/ P95-C 1" 1.0 x 3" 1.2x) for Zeiss Primo Star series , Zeiss Primo vert series microscope	
K	Phototube to M42x0.75 mount adapter (11541510-120 HT2-1.2X) for Leica microscope	
L	Phototube to M42x0.75 mount adapter (60N-T2 4/3" 1.2x) for Zeiss Axio series microscope	
Note: For 4/3" sensor, 1.2X adapter with M42x0.75 mount should be chosen, for the 1.2" sensor, 1.0X adapter with C-mount could be used to get the better FOV;		
M	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)

9.2 E3ISPM Series C-mount USB3.0 CMOS Camera with Hardware ISP and Video Pipeline (32)

9.2.1 The Basic Characteristic of E3ISPM Series

E3ISPM series adopt SONY Exmor CMOS sensor as the image-picking device and USB3.0 is used as the transfer interface.

E3ISPM series hardware resolutions range from 1.5M to 45M and come with the integrated CNC aluminum alloy compact housing.

E3ISPM series integrated with 12 bit Ultra-Fine Hardware Image Signal Processor Video Pipeline(Ultra-Fine HISP VP) for Demosaic, Automatic Exposition, Gain Adjustment, One Push White Balance, Chrominance Adjustment, Saturation Adjustment, Gamma Correction, Luminance Adjustment, Contrast Adjustment, Bayer and finally form RAW data for 8/12 bit output. This will move the heavier burden of the processing from the PC to the Ultra-Fine HISP VP and greatly accelerating the processing speed.

E3ISPM series comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/ Linux/ macOS /Android multiple platform SDK (Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc);

The E3ISPM series can be widely used in bright field light environment and microscope image capture and analysis with higher frame rate.

The basic characteristic of E3ISPM series are as follows:

- SONY Exmor, Exmor R(Back-illuminated), Exmor RS CMOS sensor with USB3.0 interface;
- Real-time 8/12bit depth switch(depending on sensor);
- Ultra-Fine HISP VP and USB3.0 5 Gbps interface ensuring high frame rates;
- Super high sensitivity up to 2188mV(IMX264);
- Ultra-low noise and low power dissipation by using column-parallel A/D conversion;
- With hardware resolution among 1.5M to 45M;
- Rolling shutter or global shutter;
- Standard C-Mount camera;
- CNC aluminum alloy housing;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.Net, DirectShow, Twain, LabView

9.2.2 E3ISPM Series Datasheet (32)

Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution	Binning	Exposure
E3ISPM45000KPA IP145000A(2021)	45M/IMX294(C) 1.4“ (18.93x13.00)	2.315x2.315	108mv with 1/30s 0.03mv with 1/30s	8.1@8176x5616 30.0@4088x2808 8.1@7408x5556 33.0@4088x2808 10.4@8176x4320 34.7@4096x2160 62.5@2048x1080 86.5@1344x720	1x1(3:2) 2x2(3:2) 1x1(4:3) 2x2(4:3) 1x1(17:9) 2x2(17:9) 3x3(17:9) 4x4(17:9)	0.1ms~15s
E3ISPM45000KPB IP145000B(2022)	45M/IMX492(C,RS) 1.4“ (18.93x13.00)	2.315x2.315	108mv with 1/30s 0.03mv with 1/30s	8.1@8176x5616(C) 30.0@4080x2808(M) 8.1@7408x5556(C) 33.0@3696x2778(M) 10.4@8176x4320(C) 34.7@4096x2160(M) 62.5@2048x1080(M) 86.5@1344x720(M)	1x1(3:2) 2x2(3:2) 1x1(4:3) 2x2(4:3) 1x1(17:9) 2x2(17:9) 3x3(17:9) 4x4(17:9)	0.1ms~15s
E3ISPM32000KPA IP132000A(2021)	32M/IMX294(C) 1.15“ (12.96x12.96)	2.315x2.315	108mv with 1/30s 0.03mv with 1/30s	8.1@5600x5600 30.0@2800x2800 30.0@1400x1400	1x1 2x2 4x4	0.1ms~15s
E3ISPM25000KPA IP125000A(2022)	25M/IMX511(C) 1/2.3 “ (5.519x5.519)	1.12x1.12	96.3mv with 1/30s 0.1mv with 1/30s	12@4928x4928 46@2464x2464 100@1648x1648	1x1 2x2 3x3	0.013ms~15s
E3ISPM21000KPA IP121000A(2020)	21M/IMX269 (C) 4/3 “(17.4x13.0)	3.3 x3.3	399mv with 1/30s 0.1mv with 1/30s	17@5280x3954 17@3952x3952 56@2640x1976 67@1760x1316 192@584x438	1x1 1x1 2x2 3x3 9x9	0.1ms~15s
E3ISPM20400KPA IP120400A 20230326	20.4M/IMX541(C,GS) 1.1 “(12.32x12.32)	2.74 x2.74	1574mv with 1/30s 0.15mv with 1/30s	17.5@4496x4496 64.4@2240x2240 64.4@1120x1120	1x1 2x2 4x4	0.03ms~15s
E3ISPM20000KPA IP120000A	20M/IMX183(C,RS) 1 “(13.06x8.76)	2.4 x2.4	462mv with 1/30s 0.21mv with 1/30s	15@5440x3648 50@2736x1824 60@1824x1216	1x1 2x2 3x3	0.1ms~15s
E3ISPM20000KPC IP120000C(2021)	20M/IMX183(C,RS) 1 “(13.06x8.76)	2.4 x2.4	462mv with 1/30s 0.21mv with 1/30s	20@5440x3648 48@2736x1824 58@1824x1216	1x1 2x2 3x3	0.1ms~15s
E3ISPM18000KPA IP118001A	18M/SONY Special(C) 1/2.2 “(5.86x4.46)	1.2 x1.2	130mv with 1/30s 0.1mv with 1/30s	17@4880x3720 40@2448x1836 50@1728x1296	1x1 2x2 3x3	0.1ms~15s
E3ISPM15600KPA IP115600A	15.6M/SONY Special (C)1.1 “(13.0x13.0)	3.3 x3.3	399mv with 1/30s 0.1mv with 1/30s	17@3952x3952 56@1976x1976 67@1316x1316	1x1 2x2 3x3	0.1ms~15s
E3ISPM12400KPA IP112400A 20230326	12.4M/IMX545 (C,GS) 1/1.1 “(11.22x8.22)	2.74 x2.74	1337mv with 1/30s 0.15mv with 1/30s	28.2@4096x3000 100.9@2048x1500 100.9@1024x750	1x1 2x2 4x4	0.03ms~15s
E3ISPM12300KPA IP112300A	12.3M/IMX304(C, GS) 1.1”(14.13x10.35)	3.45x3.45	1146mv with 1/30s 0.1mv with 1/30s	23.4@4096x3000 46.3@2048x1500	1x1 1x1	0.244ms~15s
E3ISPM12000KPA IP112000A	12M/IMX226(C) 1/1.7“(7.40x5.55)	1.85x1.85	280mv with 1/30s 0.1mv with 1/30s	25@4000x3000 50@2048x1080	1x1 2x2	0.1ms~15s
E3ISPM12000KPB IP112000B(2022)	12M/IMX577(C) 1/2“(6.29x4.71)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	30@4056x3040 60@2028x1520 120@1014x760	1x1 2x2 4x4	0.1ms~5s
E3ISPM12000KPC IP112000C(20230717)	12M/IMX676(C) 1/1.6“(7.07x7.07)	2.0x2.0	3637mv with 12 bit converted value(HCG) 0.15mv with 1/30s	27@3536x3536 60@1768x1768	1x1 2x2	0.013ms~15s
E3ISPM09000KPA IP109000A	9.0M/IMX305(C, GS) 1“ (14.13x7.45)	3.45x3.45	1146mv with 1/30s 0.15mv with 1/30s	34@4096x2160 60@2048x1080	1x1 1x1	0.1ms~15s
E3ISPM09000KPB IP109000B	9.0M/IMX533(C) 1“ (11.31x11.28)	3.76x3.76	535mv with 1/30s 0.04mv with 1/30s	40@3008x3000 123@1488x1500 186@992x998	1x1 2x2 3x3	0.1ms~15s
E3ISPM08300KPA IP108300A	8.3M/IMX274(C) 1/2.5”(6.22x3.50)	1.62x1.62	236mv with 1/30s 0.1mv with 1/30s	32@3840x2160 65@1920x1080	1x1 2x2	0.244ms~15s
E3ISPM08300KPB IP108300B	8.3M/IMX334(C) 1/1.8”(7.68x4.32)	2.0x2.0	505mv with 1/30s 0.1mv with 1/30s	35@3840x2160 60@1920x1080	1x1 2x2	0.02ms~15s
E3ISPM08300KPC IP108300C	8.3M/IMX485(C) 1/1.2”(11.14x6.26)	2.9x2.9	2188mv with 1/30s 0.15mv with 1/30s	45@3840x2160 70@1920x1080	1x1 2x2	0.02ms~15s
E3ISPM08300KPD IP108300D(2022)	8.3M/IMX585(C) 1/1.2”(11.14x6.26)	2.9x2.9	5970(mV/lx/s) 0.13mv with 1/30s	45@3840x2160 70@1920x1080	1x1 2x2	0.02ms~15s
E3ISPM08300KPE IP108300E(2022)	8.3M/IMX678(C) 1/1.8”(7.68x4.32)	2.0x2.0	3541(mV/lx/s) 0.15mv with 1/30s	45@3840x2160 70@1920x1080	1x1 2x2	0.02ms~15s
E3ISPM08000KPA IP108000A	8.0M/IMX294(C) 1.15 “(13.00x13.00)	4.63 x4.63	419mv with 1/30s 0.12mv with 1/30s	30@2808x2808(14bit) 139@1392x1392	1x1 2x2	0.1ms~15s

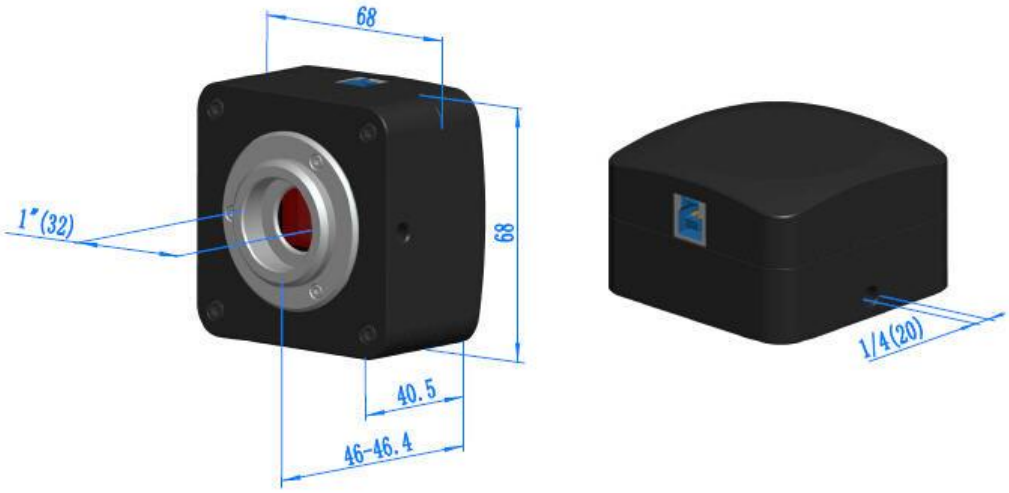
				139@696x696	4x4	
E3ISPM06300KPA IP106300A	6.3M/IMX178(C,RS) 1/1.8“ (7.37x4.92)	2.4x2.4	425mv with 1/30s 0.15mv with 1/30s	30@3072 x2048 38@1536x 1024	1x1 2x2	0.1ms~15s
E3ISPM06300KPB IP106300B	6.3M/IMX178(C,RS) 1/1.8“ (7.37x4.92)	2.4x2.4	425mv with 1/30s 0.15mv with 1/30s	59@3072 x2048 59@1536x 1024	1x1 2x2	0.02ms~15s
E3ISPM05100KPA IP105100A 20230326	5.1M/IMX547(C,GS) 1/1.8“ (6.71x5.61)	2.74x2.74	1337mv with 1/30s 0.15mv with 1/30s	63@2448x2048 208.4@1224x1024	1x1 2x2	0.03ms~15s
E3ISPM05000KPA IP105000A	5.0M/IMX264(C, GS) 2/3” (8.45x7.07)	3.45x3.45	1146mv with 1/30s 0.15mv with 1/30s	35@2448x2048 50@1224x1024	1x1 1x1	0.1ms~15s
E3ISPM03100KPA IP103100A	3.1M/IMX265(C, GS) 1/1.8“ (7.07x5.30)	3.45x3.45	1146mv with 1/30s 0.15mv with 1/30s	53@2048x1536 85@1024x768	1x1 1x1	0.1ms~15s
E3ISPM03100KPB IP103100B	3.1M/IMX123(C) 1/2.8“ (5.12x3.84)	2.5x2.5	600mv with 1/30s 0.15mv with 1/30s	50@2048x1536 50@1920x1080	1x1 1x1	0.1ms~15s
E3ISPM02100KPA IP102100A(2021)	2.1M/IMX482(C) 1/1.2”(11.14x6.26)	5.8x5.8	8935mv with 1/30s 0.6mv with 1/30s	96@1920x1080	1x1	14us~15s
E3ISPM02000KPA IP102000A	2M/IMX385(C) 1/2“ (7.2x4.05)	3.75x3.75	2350mv with 1/30s 0.15mv with 1/30s	125@1920x1080	1x1	0.1ms~15s
E3ISPM01500KPA IP101500A	1.5M/IMX273(C, GS) 1/2.9“ (4.968x3.726)	3.45x3.45	1146mv with 1/30s 0.15mv with 1/30s	164@1440x1080 320@720x540	1x1 2x2	0.1ms~15s

C: Color; M: Monochrome; GS: Global Shutter

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine HISPVP /NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
ADC	8 Bit / 12 Bit
Recording System	Still Picture and Movie
Cooling System*	Natural
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB3. 0 Port. Compatible with USB2.0
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory: 2GB or More
	USB Port: USB3.0 High-speed Port
	Display: 17” or Larger
	CD-ROM

9.2.3 Dimension of E3ISPM Series

The E3ISPM series body, made from tough, CNC aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



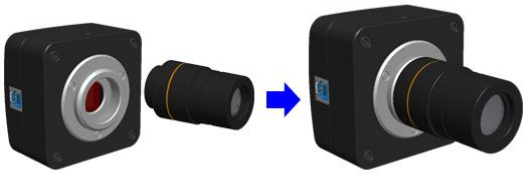
Dimension of E3ISPM Series

9.2.4 Packing Information for E3ISPM Series

Packing Information of E3ISPM Series

Standard Camera Packing List			
A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo		
B	Gift box L:15cm W:15cm H:10cm (0.58~0.6Kg/ box)		
C	One E3ISPM series camera		
D	High-speed USB3.0 A male to B male gold-plated connectors cable /2.0m		
E	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
F	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075 108004/AMA100
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075 108011/ATA100
G	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075 108008/FMA100
		C-Mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075 108014/FTA100
Note: For F and G optional items, please specify your camera type(C-mount, microscope camera or telescope camera) , ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
H	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
I	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
J	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube		
K	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

9.2.5 Extension of E3ISPM Series with Microscope or Telescope Adapter

<table>
<tr><th>Extension</th><th colspan="2">Picture</th></tr>
<tr><td>C-mount Camera</td><td>  </td><td>Machine vision; Medical imaging;
Semiconductor equipment; Test instruments;
Document scanners; 2D barcode readers;
Web camera and security video;
Microscope imaging;</td></tr>
<tr><td>Microscope Camera</td><td colspan="2" rowspan="2"> 
E3ISPM+AMAXXX(23.2mm Adapter)
 
E3ISPM+FMAXXX(23.2mm Adapter)
 
E3ISPM+ATAXXX(31.75mm Adapter)
 
E3ISPM+FTAXXX(31.75mm Adapter)</td></tr>
<tr><td>Telescope Camera</td></tr>
</table>

9.3 E3CMOS Series C-mount USB3.0 CMOS Camera (23)

9.3.1 The Basic Characteristic of E3CMOS Series

E3CMOS series adopt SONY Exmor CMOS sensor as the image-picking device and USB3.0 is used as the data transfer interface.

E3CMOS series hardware resolutions range from 0.4M to 20M and come with the integrated CNC aluminum alloy compact housing.

E3CMOS series comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/ Linux/macOS /Android multiple platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc);

The E3CMOS series can be widely used in bright field light environment and microscope image capture and analysis with higher frame rate.

The basic characteristic of E3CMOS series cameras are as follows:

- SONY Exmor, Exmor R(Back-illuminated), Exmor RS CMOS sensor with USB3.0 interface;
- Real-time 8/12/14/16bit depth switch(depending on sensor);
- Super high sensitivity up to 1120mV(IMX185);
- Ultra-low noise and low power dissipation by using column-parallel A/D conversion;
- With hardware resolution among 0.4M to 20M;
- Rolling shutter or global shutter;
- Standard C-Mount camera;
- CNC aluminum alloy housing;
- USB3.0 5 Gbps interface ensuring high frame rates;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.Net, DirectShow, Twain, LabView

9.3.2 E3CMOS Series Datasheet(23)

Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution ADC	Binning	Exposure
E3CMOS45000KMA EM145000A	45M/IMX492(M,RS) 4/3“ (19.11x13.00)	2.315x2.315	176mv with 1/30s 0.03mv with 1/30s	8.1@8176x5616 30.0@4080x2808 8.1@7408x5556 33.0@3696x2778 10.4@8176x4320 34.7@4096x2160 62.5@2048x1080 86.5@1360x720 8 Bit / 12 Bit	1x1(3:2) 2x2(3:2) 1x1(4:3) 2x2(4:3) 1x1(17:9) 2x2(17:9) 3x3(17:9) 4x4(17:9)	0.1ms~15s
E3CMOS20400KMA EM120400A 20230326	20.4M/IMX541(M,GS) 1.1 “(12.32x12.32)	2.74 x2.74	2649mv with 1/30s 0.15mv with 1/30s	17.5@4496x4496 64.4@2240x2240 64.4@1120x1120	1x1 2x2 4x4	0.03ms~15s
E3CMOS20000KMA EM120000A(New)	20M/IMX183(M,RS) 1 “(13.06x8.76)	2.4 x2.4	776mv with 1/30s 0.21mv with 1/30s	17.5@5440x3648 40@4080x2160 48@2736x1824 60@1824x1216 8 Bit / 12 Bit	1x1 1x1 2x2 3x3	0.1ms~60s
E3CMOS20000KPB EP120000B(New)	20M/IMX147(C) 1/2.1 “(6.24x4.67)	1.2 x1.2	130mv with 1/30s 0.1mv with 1/30s	5.2@5200x3888 15@2592x1944 30@1728x1296 8 Bit / 12 Bit	1x1 2x2 3x3	0.1ms~15s
E3CMOS12400KMA EM112400A 20230326	12.4M/IMX545(M,GS) 1/1.1 “(11.22x8.22)	2.74 x2.74	2252mv with 1/30s 0.15mv with 1/30s	28.2@4096x3000 100.9@2048x1500 100.9@1024x750	1x1 2x2 4x4	0.03ms~15s
E3CMOS12300KMA EM112300A(New)	12.3M/IMX304(M) 1.1 ”(14.13x10.35)	3.45 x3.45	1146mv with 1/30s 0.1mv with 1/30s	23.4@4096x3000 46.3@2048x1500 8 Bit / 12 Bit	1x1 1x1	0.244ms~15s
E3CMOS12000KPA EP112000A	12M/IMX226(C) 1/1.7“(7.40x5.55)	1.85x1.85	280mv with 1/30s 0.1mv with 1/30s	7.1@4000x3000 30@2048x1080 8 Bit / 12 Bit	1x1 2x2	0.244ms~2000ms
E3CMOS06300KPA EP106300A	6.3M/IMX178(C,RS) 1/1.8“ (7.37x4.92)	2.4x2.4	425mv with 1/30s 0.15mv with 1/30s	15@3072 x2048 26@1536x 1024 8 Bit / 14 Bit	1x1 2x2	0.244ms~2000ms
E3CMOS06300KMA EM106300A	6.3M/IMX178(M,RS) 1/1.8“ (7.37x4.92)	2.4x2.4	760mv with 1/30s 0.15mv with 1/30s	30@3072 x2048 50@1536x 1024 8 Bit / 14 Bit	1x1 2x2	0.244ms~2000ms
E3CMOS05100KMA EM105100A 20230326	5.1M/IMX547(M,GS) 1/1.8“ (6.71x5.61)	2.74x2.74	2252mv with 1/30s 0.15mv with 1/30s	63@2448x2048 208.4@1224x1024	1x1 2x2	0.03ms~15s
E3CMOS05000KMA EM105000A	5.0M/IMX264(M, GS) 2/3” (8.45x7.07)	3.45x3.45	1830mv with 1/30s 0.15mv with 1/30s	35@2448x2048 60@1224x1024 8 Bit / 12 Bit	1x1 2x2	0.1ms~60s
E3CMOS03100KPB EP103100B	3.1M/IMX123(C) 1/2.8“ (5.12x3.84)	2.5x2.5	600mv with 1/30s 0.15mv with 1/30s	25@2048x1536 30@1920x1080 8 Bit / 14 Bit	1x1 1x1	0.244ms~2000ms
E3CMOS03100KMC EM103100C	3.1M/IMX265(M, GS) 1/1.8“ (7.07x5.30)	3.45x3.45	1146mv with 1/30s 0.15mv with 1/30s	53@2048x1536 85@1024x768 8 Bit / 12 Bit	1x1 2x2	0.1ms~15s
E3CMOS02300KPA EP102300A	2.3M/IMX185(C) 1/1.9“ (7.20x4.50)	3.75x3.75	1120mv with 1/30s 0.15mv with 1/30s	38@1920x1200 66@960x600 8 Bit / 12 Bit	1x1 2x2	0.244ms ~2000ms
E3CMOS02300KPB EP102300B	2.3M/IMX249(C, GS) 1/1.2“ (11.25x7.03)	5.86x5.86	1016mv with 1/30s 0.15mv with 1/30s	30@1920x1200 8 Bit / 12 Bit	1x1	0.244ms~2000ms
E3CMOS02300KMC EM102300C	2.3M/IMX174(M, GS) 1/1.2” (11.25x7.03)	5.86x5.86	1016mv with 1/30s 0.15mv with 1/30s	120@1920x1200 8 Bit / 12 Bit	1x1	0.244ms~2000ms
E3CMOS01500KMA EM101500A	1.5M/IMX273(M, GS) 1/2.9“ (4.968x3.726)	3.45x3.45	915mv with 1/30s(F8.0) 0.15mv with 1/30s	228@1440x1080 530@720x540 8 Bit / 12 Bit	1x1 2x2	0.1ms~60s
E3CMOS01200KPA EP101200A	1.2M/IMX224(C) 1/3“(4.80x3.60)	3.75 x3.75	2040mv with 1/30s 0.15mv with 1/30s	60@1280x960 120@640x480 8 Bit / 12 Bit	1x1 2x2	0.105ms~15s
E3CMOS00400KPA EP100400A(2023)	0.4M/IMX287(C, GS) 1/2.9”(4.97x3.73)	6.9x6.9	4584mv with 1/30s 0.15mv with 1/30s	520@720x540 8 Bit / 12 Bit	1x1	0.244ms~15s
E3CMOS00400KMA EM100400A(2023)	0.4M/IMX287(M, GS) 1/2.9”(4.97x3.73)	6.9x6.9	7469mv with 1/30s 0.15mv with 1/30s	520@720x540 8 Bit / 12 Bit	1x1	0.244ms~15s
~~E3CMOS20000KPA EP120000A(Suspended)~~	20M/IMX183(C,RS) 1 “(13.06x8.76)	2.4 x2.4	462mv with 1/30s 0.21mv with 1/30s	5.5@5440x3648 16@2736x1824 21@1824x1216 8 Bit / 12 Bit	1x1 2x2 3x3	0.1ms~15s
~~E3CMOS05000KPA EP105000A(Suspended)~~	5.0M/IMX264(C, GS) 2/3” (8.45x7.07)	3.45x3.45	1146mv with 1/30s 0.15mv with 1/30s	15@2448x2048 51@1224x1024 8 Bit / 12 Bit	1x1 1x1	0.1ms~60s
~~E3CMOS03100KPA~~	3.1M/IMX036(C)	2.5x2.5	200mv with 1/30s	28@2048x1536	1x1	0.244ms

~~EP103100A(Suspended)~~	1/2.8“ ((5.12x3.84)		0.5mv with 1/30s	28@1024x768 8 Bit / 12 Bit	2x2	~2000ms

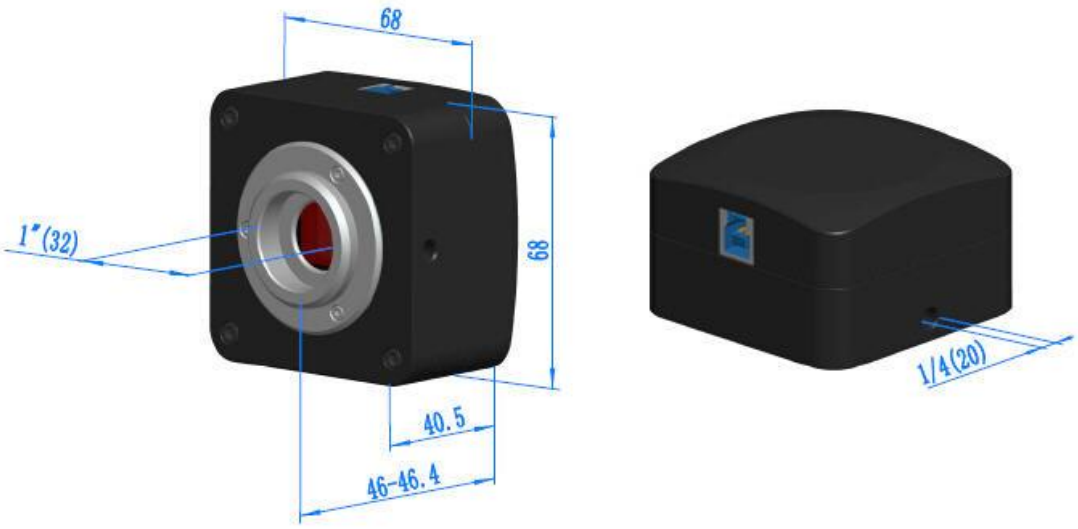
C: Color; M: Monochrome; GS: Global Shutter

For the suspended models, customer can choose the corresponding models from E3ISPM series with faster frame rate.

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine/NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
Recording System	Still Picture and Movie
Cooling System*	Natural
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory: 2GB or More
	USB Port: USB3.0 High-speed Port
	Display: 17” or Larger
	CD-ROM

9.3.3 Dimension of E3CMOS Series

The E3CMOS series body, made from tough, CNC aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



Dimension of E3CMOS Series

9.3.4 Packing Information for E3CMOS Series

Packing Information of E3CMOS Series

Standard Camera Packing List			
A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo		
B	Gift box L:15cm W:15cm H:10cm (0.58~0.6Kg/ box)		
C	One E3CMOS series camera		
D	High-speed USB3.0 A male to B male gold-plated connectors cable /2.0m		
E	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
F	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075 108004/AMA100
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075 108011/ATA100
G	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075 108008/FMA100
		C-Mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075 108014/FTA100
Note: For F and G optional items, please specify your camera type(C-mount, microscope camera or telescope camera) , ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
H	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
I	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
J	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube		
K	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

9.3.5 Extension of E3CMOS Series with Microscope or Telescope Adapter

<table>
<tr><th>Extension</th><th colspan="2">Picture</th></tr>
<tr><td>C-mount Camera</td><td>  </td><td>Machine vision; Medical imaging;
Semiconductor equipment; Test instruments;
Document scanners; 2D barcode readers;
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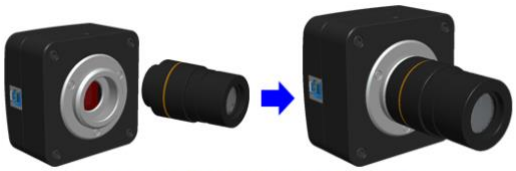
<tr><td>Microscope Camera</td><td colspan="2"> 
E3CMOS+AMAXXX(23.2mm Adapter)
 
E3CMOS+FMAXXX(23.2mm Adapter)</td></tr>
<tr><td>Telescope Camera</td><td colspan="2"> 
E3CMOS+ATAXXX(31.75mm Adapter)
 
E3CMOS+FTAXXX(31.75mm Adapter)</td></tr>
</table>

9.4 U3ISPM Series C-mount USB3.0 CMOS Camera with Hardware ISP and Video Pipeline Inside (4)

9.4.1 The Basic Characteristic of U3ISPM Series

U3ISPM series is an ultra-high performance USB3.0 CMOS camera and it adopts ultra-high performance CMOS sensor as the image-picking device and USB3.0 is used as the data transfer interface.

U3ISPM series integrated with 12 bit Ultra-Fine Hardware Image Signal Processor Video Pipeline(Ultra-Fine HISP VP) for Demosaic, Adjustments, Automatic Exposition, Gain Adjustment, One Push White Balance, Chrominance Adjustment, Saturation Adjustment, Gamma Correction, Luminance Adjustment, Contrast Adjustment, Bayer and finally form RAW data for 8/12 bit output. This will move the heavier burden of the processing from the PC to the Ultra-Fine HISP VP and greatly accelerating the processing speed.

U3ISPM series comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/ Linux/macOS/ Android multiple platform SDK (Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc);

The U3ISPM series can be widely used in bright field light environment and microscope image capture and analysis with higher frame rate.

The basic characteristic of the U3ISPM series are as follows:

- Standard C-Mount camera with Aptina or Panasonic CMOS sensor;
- Ultra-Fine HISP VP and USB3.0 5 Gbps interface ensuring high frame rates(Up to 13 frames for 18M resolution);
- CNC aluminum alloy housing;
- USB3.0 5 Gbps interface ensuring high frame rate;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

9.4.2 U3ISPM Series Datasheet(4)

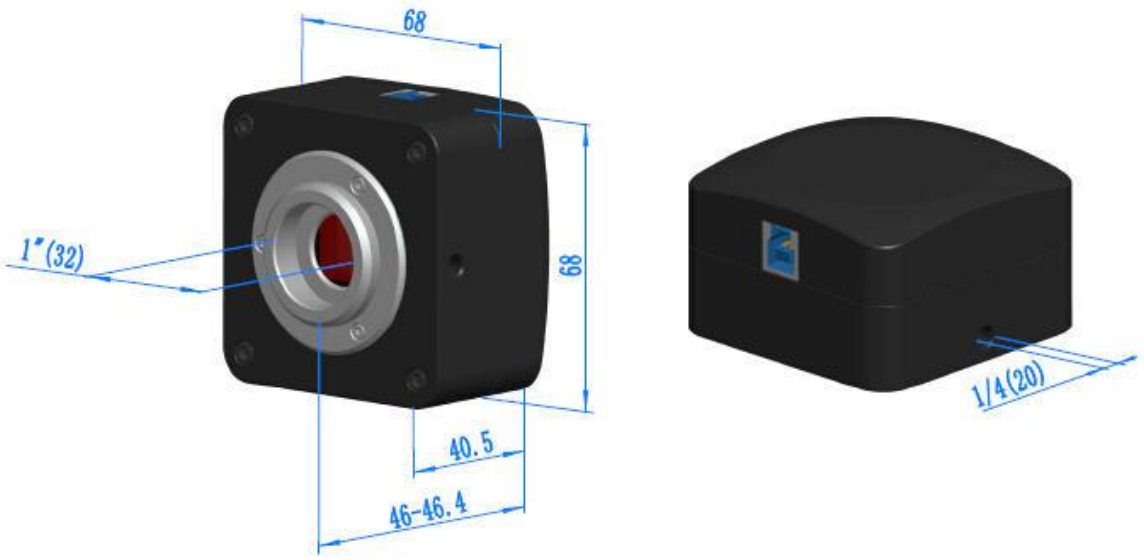
Order Code	Sensor & Size	Pixel(μm)	G Responsivity Dynamic range SNRmax	FPS/Resolution	Binning	Exposure
U3ISPM18000KPA IP118000A(New)	18M/AR1820(C) 1/2.3"(6.14x4.61)	1.25x1.25	0.62 V/lux-sec 65.8dB 36.3	13.1@4912x3684 34.3@2456x1842 54.4@1228x922	1x1 2x2 4x4	0.1ms~2s
U3ISPM16000KPA IP116000A(New)	16M/MN34120(C) 1/2.33"(6.18x4.67)	1.335x1.335	R: 2453LSB Gr: 2444LSB Gb: 1054LSB B: 996LSB	16@4632x3488 30@2320x1740 27@1536x1160	1x1 2x2 3x3	0.2ms~2s
U3ISPM16000KPB IP116000B(New)	16M/MN34230(C) 4/3"(17.60x13.30)	3.8x3.8	R: 1315LSB Gr: 2413LSB Gb: 2413LSB B: 1042LSB (Gain = 0dB)	22@4640x3506 30@3360x2526 43@2304x1750 49@1536x1168	1x1 2x2 3x3	0.2ms~15s
U3ISPM20000KPA IP120000A 20231018	20M/AR2020(C) 1/1.8"(7.17x5.38)	1.4x1.4	8.4 ke−/lux.sec	20@5120x3840 45@2560x1920	1x1 2x2	0.2ms~15s

C: Color; M: Monochrome;

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine HISP VP /NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
ADC	8 Bit / 12 Bit
Recording System	Still Picture and Movie
Cooling System*	Natural
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB3.0 High-speed Port
	Display:17" or Larger
	CD-ROM

9.4.3 Dimension of U3ISPM Series

The U3ISPM series body, made from tough, aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



Dimension of U3ISPM Series

9.4.4 Packing Information for U3ISPM Series

Packing Information of U3ISPM Series

Standard Camera Packing List			
A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo		
B	Gift box L:15cm W:15cm H:10cm (0.67~0.7Kg/ box)		
C	One U3ISPM series camera		
D	High-speed USB3.0 A male to B male gold-plated connectors cable /2.0m		
E	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
F	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075
G	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075
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Note: For F and G optional items, please specify your camera type(C-mount, microscope camera or telescope camera) , ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
H	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
I	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
J	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube		
K	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

9.4.5 Extension of U3ISPM Series with Microscope or Telescope Adapter

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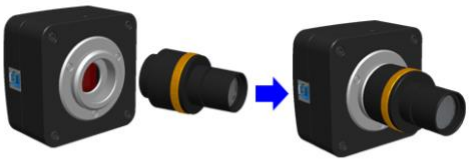
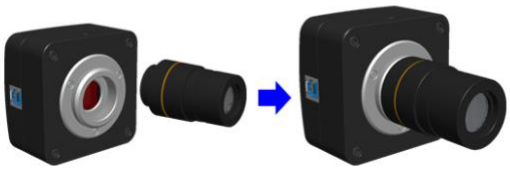
<tr><td>Microscope Camera</td><td colspan="2"> 
U3ISPM+AMAXXX(23.2mm Adapter)
 
U3ISPM+FMAXXX(23.2mm Adapter)</td></tr>
<tr><td>Telescope Camera</td><td colspan="2"> 
U3ISPM+ATAXXX(31.75mm Adapter)
 
U3ISPM+FTAXXX(31.75mm Adapter)</td></tr>
</table>

9.5 L3CMOS Series C-mount USB3.0 CMOS Camera (6)

9.5.1 The Basic Characteristic of L3CMOS Series

L3CMOS series is Luxurious USB3.0 CMOS camera with frame buffers and it adopts ultra-high performance CMOS sensor as the image-picking device, and USB3.0 is used as the data transfer interface.

L3CMOS series comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/Linux/ OSX multiple platforms SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

The L3CMOS series can be widely used in bright field light environment and microscope image capture and analysis.

The basic characteristic of L3COMS series cameras are as follows:

- C-Mount camera has 25.4 mm or 1-inch diameter with 32 threads per inch;
- Scientific research grade camera with Aptina CMOS sensor;
- On-board memory for perfect synchronization, higher frame rate and stable performance;
- High performance cooling structure, ensures low image noise;
- USB3.0 5 Gbps interface ensuring high frame rate;
- Ultra-Fine color engine with perfect color reproduction capability;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

9.5.2 L3CMOS Series Datasheet(6)

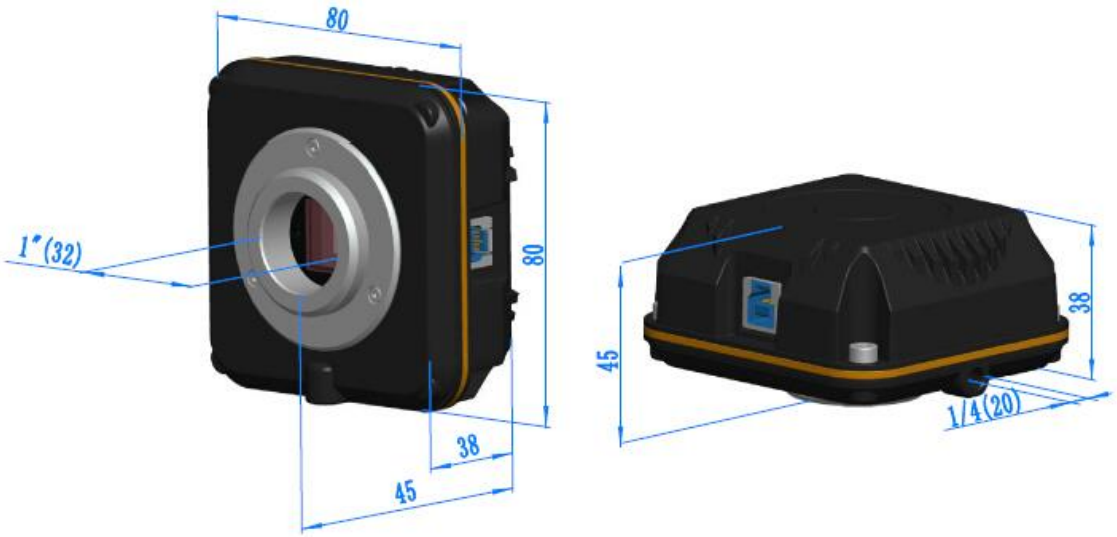
Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dynamic Range SN Ratio	FPS/Resolution	Binning	Exposure
L3CMOS14000KPA LP114000A	14M/MT9F002(C) 1/2.3"(5.73x4.60)	1.4x1.4	0.724v/lux-sec 65.3dB 35.5dB	6.2@4096x3286 20.8@2048x1644 53.3@1024x822	1x1 2x2 4x4	0.1ms~2000ms
L3CMOS12000KPA LP112000A(2022)	12M/IMX577(C) 1/2.1" (5.95x4.71)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	8.5@3840x3040 49@1920x1516 137@960x758	1x1 2x2 4x4	0.1ms~2000ms
L3CMOS10000KPA LP110000A(2022)	10M/IMX577(C) 1/2.3" (5.68x4.26)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	8.5@3664x2748 49@1832x1374 137@912x686	1x1 2x2 4x4	0.1ms~2000ms
L3CMOS08500KPA LP108500A(2022)	8.5M/Special(C) 1/2.4"(5.16x3.95)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	10@3328x2548 56@1664x1272	1x1 2x2	0.1ms~2000ms
L3CMOS05100KPA LP105100A(2022)	5.1M/AR0521(C) 1/2.5" (5.70x4.28)	2.2x2.2	18.8ke-/lux 73dB 40dB	15.5@2592x1944 49.5@1296x972 97.5@648x486	1x1 2x2 4x4	0.1ms~2000ms
L3CMOS03100KPA LP103100A	3.1M/AR0330(C) 1/3" (4.51x3.37)	2.2x2.2	1.9v/lux-sec 100dB 39dB	27.3@2048x1534 53.3@1024x770	1x1 2x2	0.1ms~2000ms
~~L3CMOS10000KPA~~ ~~LP110000A~~	10M/MT9J003(C) 1/2.3" (5.98x4.58)	1.67x1.67	0.31v/lux-sec 65.2dB 34dB	7.2@3584x2746 24.5@1792x1372	1x1 2x2 4x4	0.1ms~2000ms
~~L3CMOS08500KPA~~ ~~LP108500A~~	8.5M/Special(C) 1/2.4"(5.56x4.26)	1.67x1.67	0.31v/lux-sec 65.2dB 34dB	8.3@3328x2548 26.2@1664x1272	1x1 2x2 4x4	0.1ms~2000ms
~~L3CMOS05100KPA~~ ~~LP105100A~~	5.1M/MT9P006(C) 1/2.5" (5.63x4.23)	2.2x2.2	1.76v/lux-sec 67.74dB 38.5dB	14.2@2560x1922 38.3@1280x960 101.2@640x480	1x1 2x2 4x4	0.05ms~2000ms

C: Color; M: Monochrome;

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine/NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
ADC	8 Bit / 12 Bit
Recording System	Still Picture and Movie
Cooling System*	Natural with High Performance Cooling Structure
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB3.0 High-speed Port
	Display:17" or Larger
	CD-ROM

9.5.3 Dimension of L3CMOS Series

The L3CMOS series body, made from tough, aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



Dimension of L3CMOS Series

9.5.4 Packing Information of L3CMOS Series

Packing Information of L3CMOS Series

Standard Camera Packing List			
A	Carton L:40cm W:36cm H:36cm (16pcs, 12~17Kg/ carton), not shown in the photo		
B	Gift box L:16.4cm W:16.4cm H:9.6cm (0.72~0.8Kg/ box)		
C	One L3CMOS series camera		
D	High-speed USB3.0 A male to B male gold-plated connectors cable /2.0m		
E	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
F	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075
G	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075
Note: For F and G optional items, please specify your camera type(C-mount, microscope camera or telescope camera) , ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
H	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
I	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
J	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube		
K	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

9.5.5 Extension of L3CMOS Series with Microscope or Telescope Adapter

<table>
<tr><th>Extension</th><th colspan="2">Picture</th></tr>
<tr><td>C-mount Camera</td><td>  </td><td>Machine vision; Medical imaging;
Semiconductor equipment; Test instruments;
Document scanners; 2D barcode readers;
Web camera and security video;
Microscope imaging;</td></tr>
<tr><td>Microscope Camera</td><td colspan="2" rowspan="2"> 
L3CMOS+AMAXXX(23.2mm Adapter)
 
L3CMOS+FMAXXX(23.2mm Adapter)
 
L3CMOS+ATAXXX(31.75mm Adapter)
 
L3CMOS+FTAXXX(31.75mm Adapter)</td></tr>
<tr><td>Telescope Camera</td></tr>
</table>

9.6 U3CMOS Series C-mount USB3.0 CMOS Camera (12)

9.6.1 The Basic Characteristic of U3CMOS Series

U3CMOS is an ultra-high performance USB3.0 CMOS camera and it adopts ultra-high performance CMOS sensor as the image-picking device and USB3.0 is used as the data transfer interface.

U3CMOS hardware resolutions range from 3.0M to 18M and come with the CNC aluminum alloy compact housing.

U3CMOS comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/Linux/OSX multiple platforms SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

The U3CMOS can be widely used in bright field light environment and microscope image capture and analysis with higher frame rate.

The basic characteristic of the U3CMOS cameras are as follows:

- Standard C-Mount camera with Aptina CMOS sensor;
- With hardware resolution among 3.0M to 18M;
- CNC aluminum alloy housing;
- USB3.0 5 Gbps interface ensuring high frame rate;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

9.6.2 U3CMOS Series Datasheet(12)

Order Code	Sensor & Size	Pixel(μm)	G Responsivity Dynamic range SNRmax	FPS/Resolution	Binning	Exposure
U3CMOS18000KPA TP118000A	18M/AR1820(C) 1/2.3"(6.14x4.61)	1.25x1.25	0.62 V/lux-sec 65.8dB 36.3	5.6@4912x3684 18.1@2456x1842 32.2@1228x922	1x1 2x2 4x4	0.1ms~2000ms
U3CMOS16000KPA TP116000A	16M/MN34120(C) 1/2.33"(6.18x4.66)	1.335x1.335	R: 2453LSB Gr: 2444LSB Gb: 1054LSB B: 996LSB	6.0@4632x3488 15.0@2320x1740 26.0@1536x1160	1x1 2x2 3x3	0.2ms~2000ms
U3CMOS16000KPB TP116000B	16M/MN34230PLJ(C) 4/3" (17.60x13.30)	3.8x3.8	R: 1315LSB Gr: 2413LSB Gb: 2413LSB B: 1042LSB(Gain = 0dB)	6.0@4648x3506 15.0@2304x1750 30.0@1536x1168	1x1 2x2 3x3	0.06ms~15s
U3CMOS16000KMB TM116000B	16M/MN34230ALJ(M) 4/3" (17.60x13.30)	3.8x3.8	A: 2650LSB B: 2650LSB C: 2650LSB D: 2650LSB(Gain = 0dB)	22@4640x3506 36@3840x2160 43@2304x1750 43@1920x1080 49@1536x1168	1x1 1x1 2x2 3x3 3x3	0.224ms~15s
U3CMOS14000KPA TP114000A	14M/MT9F002(C) 1/2.3"(5.73x4.60)	1.4x1.4	0.724v/lux-sec 65.3dB 35.5dB	6.2@4096x3286 20.8@2048x1644 53.3@1024x822	1x1 2x2 3x3	0.4ms~2000ms
U3CMOS12000KPA TP112000A(2022)	12M/IMX577(C) 1/2.1" (5.95x4.71)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	8.5@3840x3040 49@1920x1516 137@960x758	1x1 2x2 4x4	0.1ms~2000ms
U3CMOS10000KPA TP110000A(2022)	10M/IMX577(C) 1/2.3" (5.68x4.26)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	8.5@3664x2748 49@1832x1374 137@912x686	1x1 2x2 4x4	0.1ms~2000ms
U3CMOS10000KMA TM110000A	10M/MT9J003(M) 1/2.3"(5.98x4.58)	1.67x1.67	0.4v/lux-sec 65.2dB 34dB	7.2@3584x2746 24.5@1792x1372	1x1 2x2 4x4	0.4ms~2000ms
U3CMOS08500KPA TP108500A(2022)	8.5M/Special(C) 1/2.4"(5.16x3.95)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	10@3328x2548 56@1664x1272	1x1 2x2	0.1ms~2000ms
U3CMOS05100KPA TP105100A(2022)	5.1M/AR0521(C) 1/2.5" (5.70x4.28)	2.2x2.2	18.8ke-/lux 73dB 40dB	15.5@2592x1944 49.5@1296x972 97.5@648x486	1x1 2x2 4x4	0.1ms~2000ms
U3CMOS04100KPA TP104100A(2023)	4.1M/IMX347(C) 1/1.8" (7.795x4.408)	2.9x2.9	2376mv with 1/30s 0.15mv with 1/30s	20@2688x1536 30@2048x1536 40@1536x1536 100@1344x768	1x1 1x1 1x1 1x1	0.1ms~5000ms
U3CMOS03100KPA TP103100A	3.1M/AR0330(C) 1/3" (4.51x3.38)	2.2x2.2	1.9v/lux-sec 100dB 39dB	27.3@2048x1534 53.3@1024x770	1x1 2x2	0.1ms~2000ms
~~U3CMOS10000KPA TP110000A~~	10M/MT9J003(C) 1/2.3" (5.98x4.58)	1.67x1.67	0.31v/lux-sec 65.2dB 34dB	7.2@3584x2746 24.5@1792x1372	1x1 2x2 4x4	0.4ms~2000ms
~~U3CMOS08500KPA TP108500A~~	8.5M/Special(C) 1/2.4"(5.56x4.26)	1.67x1.67	0.31v/lux-sec 65.2dB 34dB	8.3@3328x2548 26.2@1664x1272	1x1 2x2 4x4	0.1ms~2000ms
~~U3CMOS05100KPA TP105100A~~	5.1M/MT9P006(C) 1/2.5" (5.70x4.28)	2.2x2.2	1.76v/lux-sec 67.74dB 38.5dB	14.2@2560x1922 38.3@1280x960 101.2@640x480	1x1 2x2 4x4	0.1ms~2000ms

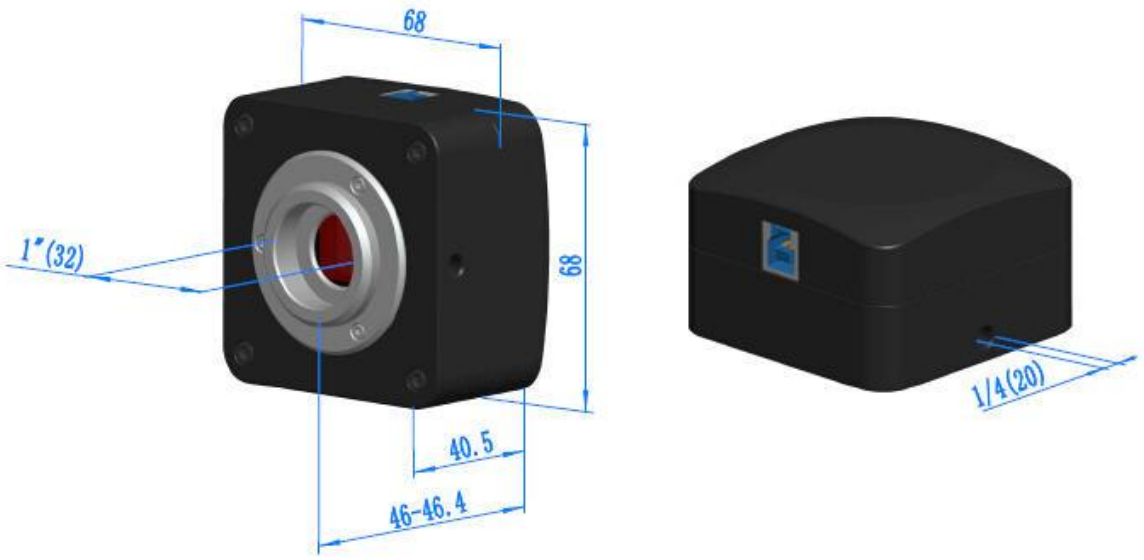
C: Color; M: Monochrome;

Other Specification for U3CMOS Camera	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine/NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
ADC	8 Bit
Recording System	Still Picture and Movie
Cooling System*	Natural
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH

Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB3.0 High-speed Port
	Display:17” or Larger
	CD-ROM

9.6.3 Dimension of U3CMOS Series

The U3CMOS body, made from tough, aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



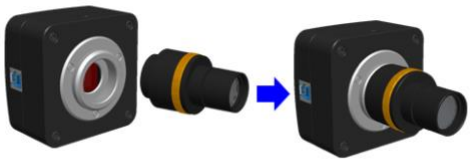
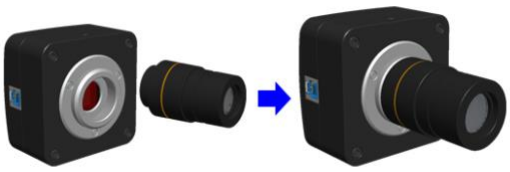
Dimension of U3CMOS Series Camera

9.6.4 Packing Information for U3CMOS Series

Packing Information of U3CMOS Series

Standard Camera Packing List			
A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo		
B	Gift box L:15cm W:15cm H:10cm (0.67~0.7Kg/ box)		
C	One U3CMOS series camera		
D	High-speed USB3.0 A male to B male gold-plated connectors cable /2.0m		
E	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
F	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075
G	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075
		C-Mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075
Note: For F and G optional items, please specify your camera type(C-mount, microscope camera or telescope camera) , ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
H	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
I	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
J	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube		
K	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

9.6.5 Extension of U3CMOS Series with Microscope or Telescope Adapter

Extension	Picture	
C-mount Camera		Machine vision; Medical imaging; Semiconductor equipment; Test instruments; Document scanners; 2D barcode readers; Web camera and security video; Microscope imaging;
Microscope Camera	 U3CMOS+AMAXXX(23.2mm Adapter)	 U3CMOS+FMAXXX(23.2mm Adapter)
Telescope Camera	 U3CMOS+ATAXXX(31.75mm Adapter)	 U3CMOS+FTAXXX(31.75mm Adapter)

9.7 C3CMOS Series C-mount USB3.0 CMOS Camera (6)

9.7.1 The Basic Characteristic of C3CMOS Series

C3CMOS series is a Compact & high performance USB3.0 CMOS series camera， it adopts Sony or OnSemi CMOS sensor as the image-picking device and USB3.0 is used as the data transfer interface.

C3CMOS series hardware resolutions range from 3.5M to 10M and come with the compact CNC aluminum alloy housing.

C3CMOS series comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/Linux/ OSX multiple platforms SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

The C3CMOS series can be widely used in bright field light environment and microscope image capture and analysis with higher frame rate.

The basic characteristic of the C3CMOS series cameras are as follows:

- Standard C-Mount camera with Sony or OnSemi CMOS sensor;
- With hardware resolution among 3.5M to 10M;
- Compact CNC aluminum alloy housing;
- USB3.0 5 Gbps interface ensuring high frame rate;
- Ultra-Fine color engine with perfect color reproduction capability;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

9.7.2 C3CMOS Series Datasheet(6)

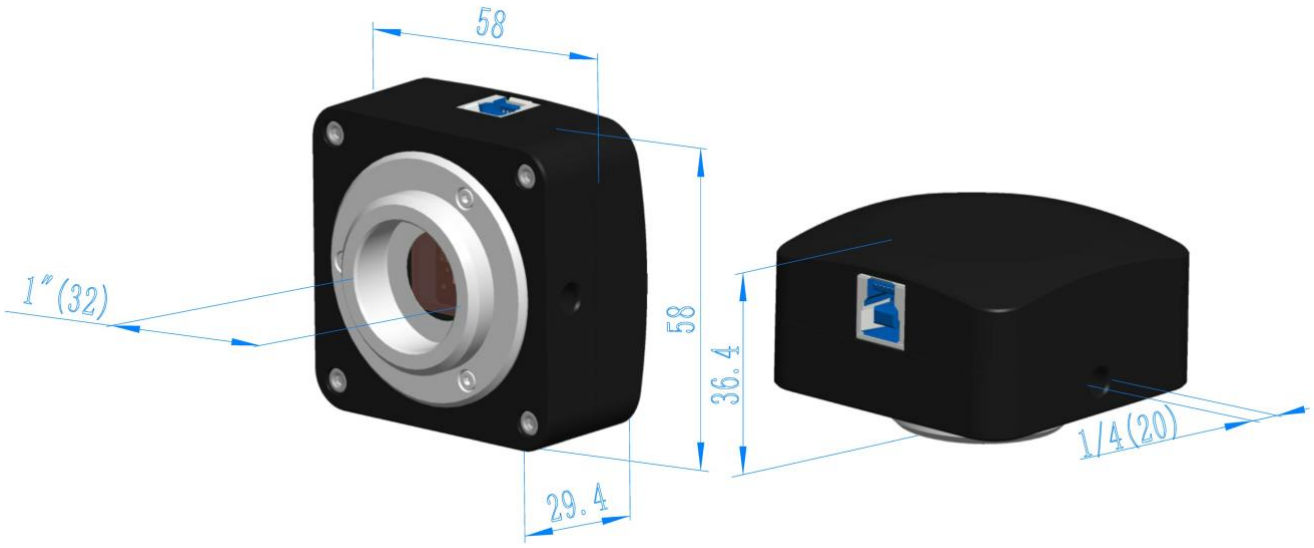
Order Code	Sensor & Size	Pixel(μm)	G Responsivity Dynamic range SNRmax	FPS/Resolution	Binning	Exposure
C3CMOS12000KPA CP112000A(2022)	12M/IMX577(C) 1/2.1“ (5.95x4.71)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	7.5@3840x3040 43@1920x1516 122@960x758	1x1 2x2 4x4	0.1ms~2000ms
C3CMOS10000KPA CP110001A(2022)	10M/IMX577(C) 1/2.3“ (5.68x4.26)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	8.5@3664x2748 49@1832x1374 137@912x686	1x1 2x2 4x4	0.1ms~2000ms
C3CMOS05100KPA CP105100A(2022)	5.1M/AR0521(C) 1/2.5“ (5.70x4.28)	2.2x2.2	18.8ke-/lux 73dB 40dB	15.5@2592x1944 49.5@1296x972 97.5@648x486	1x1 2x2 4x4	0.1ms~2000ms
C3CMOS05100KPB CP105100B(2020)	5.1M/IMX335(C) 1/2.8“ (5.18x3.89)	2.0x2.0	505mV 70dB 43dB	25@2592x1944 40@1296x972	1x1 2x2	0.1ms~2000ms
C3CMOS04100KPA CP104100A(2023)	4.1M/IMX347(C) 1/1.8“ (7.795x4.408)	2.9x2.9	2376mv with 1/30s 0.15mv with 1/30s	20@2688x1536 30@2048x1536 40@1536x1536 100@1344x768	1x1 1x1 1x1 1x1	0.1ms~5000ms
C3CMOS03500KPA CP103500A(2020)	3.5M/SC4236(C) 1/2.6“ (5.76x3.84)	2.5x2.5	3.0v/lux-sec 72dB 37dB	30@2304x1536 30@1152x768	1x1 2x2	0.1ms~2000ms
~~C3CMOS10000KPA CP110001A 20190518~~	10M/MT9J003(C) 1/2.3“ (5.98x4.58)	1.67x1.67	0.31v/lux-sec 65.2dB 34dB	7.2@3664x2748 23.8@1832x1374 77.4@912x686	1x1 2x2 4x4	0.1ms~2000ms
~~C3CMOS05100KPA CP105100A 20181030~~	5.1M/MT9P006(C) 1/2.5“ (5.70x4.28)	2.2x2.2	1.76v/lux-sec 67.74dB 38.5dB	14.0@2592x1944 29.4@1280x960 103.1@640x480	1x1 2x2 4x4	0.1ms~2000ms

C: Color; M: Monochrome;

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine/NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
ADC	8 Bit
Recording System	Still Picture and Movie
Cooling System*	Natural
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port: USB3.0 High-speed Port
	Display:17” or Larger
	CD-ROM

9.7.3 Dimension of C3CMOS Series

The C3CMOS body, made from tough, aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



Dimension of C3CMOS Series Camera

9.7.4 Packing Information for C3CMOS Series

Packing Information of C3CMOS Series

Standard Camera Packing List			
A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo		
B	Gift box L:15cm W:15cm H:10cm (0.67~0.7Kg/ box)		
C	One C3CMOS series camera		
D	High-speed USB3.0 A male to B male gold-plated connectors cable /2.0m		
E	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
F	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075
G	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075
		C-Mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075
Note: For F and G optional items, please specify your camera type(C-mount, microscope camera or telescope camera) , ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
H	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
I	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
J	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube		
K	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

9.7.5 Extension of C3CMOS Series with Microscope or Telescope Adapter

Extension	Picture	
C-mount Camera		Machine vision; Medical imaging; Semiconductor equipment; Test instruments; Document scanners; 2D barcode readers; Web camera and security video; Microscope imaging;
Microscope Camera	 C3CMOS+AMAXXX(23.2mm Adapter)	 C3CMOS+FMAXXX(23.2mm Adapter)
Telescope Camera	 C3CMOS+ATAXXX(31.75mm Adapter)	 C3CMOS+FTAXXX(31.75mm Adapter)

9.8 S3CMOS Series USB3.0 Eyepiece Camera (3)

9.8.1 The Basic Characteristic S3CMOS Series

S3CMOS series is an economic version with simple and compact structure USB3.0 CMOS eyepiece camera. So here, the S means simple and compact. USB3.0 is used as the data transfer interface.

Microscope eyepiece camera with 23.2 diameter and compact size;

The S3CMOS series comes with high-speed USB3.0 interface and high frame rate video display keep the screen smooth without interruption;

Also the S3CMOS series comes with advanced video & image processing application ToupView/ToupLite;

The S3CMOS series can be widely used to transfer the mono or binocular student microscopes to digital microscope.

With 23.2 to 30mm or 23.2 to 30.75 convert ring, the S3CMOS camera can also change the stereo microscope to digital stereo microscope.

The basic characteristic of S3CMOS series cameras are as follows:

- Microscope eyepiece camera with 23.2 diameter and compact size;
- Easy to extend to C or CS- Mount camera with high quality lens(optional);
- High-quality camera with Aptina CMOS sensor;
- Auto white balance and auto-exposure; Brightness, contrast, chroma, and saturation can be adjusted;
- High-speed USB3.0 interface and high frame rate video display keep the screen smooth without interruption;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

9.8.2 S3CMOS Series Datasheet(3)

Order Code	Sensor & Size	Pixel(μm)	G Responsivity Dynamic range SNRmax	FPS/Resolution	Binning	Exposure
S3CMOS05100KPA TP305100A(New) 06/05/2020	5.1M/IMX335(C) 1/2.8“ (5.18x3.89)	2.0x2.0	505mV 70dB 43dB	20@2592x1944 20@1280x960 20@640x480	1x1 1x1 1x1	0.1-2000 ms
S3CMOS05000KPA TP305000A	5.0M/MT9P001(C) 1/2.5"(5.70x4.28)	2.2x2.2	0.53 V/lux-sec 66.5dB 40.5dB	15@2560x1920 15@2048x1536 30@1920x1080	1x1 1x1 2x2	Auto
S3CMOS05000KPC TP305000C	5.0M/SC5033(C) 1/2.7"(5.18x3.89)	2.0x2.0	2 V/lux-sec 64dB 35dB	15@2592x1944 20@2048x1536 20@1600x1200 30@800x600	1x1 1x1 1x1 2x2	Auto

C: Color; M: Monochrome;

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	Auto White Balance
Data Format	MJPEG / YUV
Color Technique	N/A
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
Recording System	Still Picture and Movie
Cooling System*	Natural
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB3.0 Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB3.0 High-speed Port
	Display:17” or Larger
	CD-ROM

9.8.3 Dimension of S3CMOS Series

The S3CMOS series body, made from aluminum alloy blackening, ocular housing: Dia.32 X 56mm ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT filter to filter the infrared light and protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.

Dimension of S3CMOS Series

9.8.4 Packing Information for S3CMOS Series

Packing Information of S3CMOS Series

Standard Camera Packing List		
A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo	
B	Gift box L:15cm W:15cm H:10cm (0.25~0.35Kg/ box)	
C	One S3CMOS series camera	
D	High-Speed USB3.0 USB315-ATA | USB 3.0 A Male to A Male Cable,1.5m	
E	CD (Driver & utilities software, Ø8cm)	
Optional Accessory		
F	C-Mount adapter housing:108027(HS502)	
G	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube	
H	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube	
I	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube	
J	Calibration kit	106011/TS-M1(X=0.01mm/100Div.)； 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)

10 Microscope USB2.0 CMOS Camera

10.1 ECMOS Series C-mount USB2.0 CMOS Camera (7)

10.1.1 The Basic Characteristic of ECMOS

ECMOS series adopt SONY Exmor CMOS sensor as the image-picking device and USB2.0 is used as the data transfer interface.

ECMOS series hardware resolutions range from 1.2M to 8.3M and come with the integrated CNC aluminum alloy compact housing.

ECMOS series comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/Linux/ OSX multiple platforms SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

The ECMOS series can be widely used in bright field light environment and microscope image capture and analysis with higher frame rate.

The basic characteristic of ECMOS series cameras are as follows:

- SONY Exmor, Exmor R(Back-illuminated), Exmor RS CMOS sensor with USB2.0 interface;
- Real-time 8/12/14/16bit depth switch(depending on sensor);
- Super high sensitivity up to 2040mV(IMX224);
- Ultra-low noise and low power dissipation by using column-parallel A/D conversion;
- With hardware resolution among 1.2M to 8.3M;
- Rolling shutter;
- Standard C-Mount camera;
- CNC aluminum alloy housing;
- USB2.0 interface ensuring high speed data transmission;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.Net, DirectShow, Twain;

10.1.2 ECMOS Series Datasheet (7)

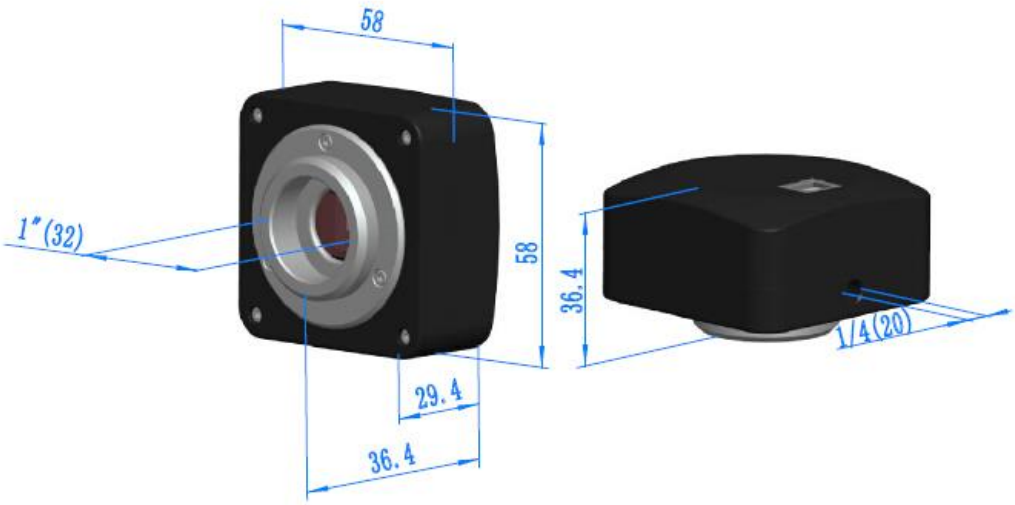
Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution	Binning	Exposure
ECMOS08300KPA EP608300A(New)	8.3M/IMX274(C) 1/2.5"(6.22x3.50)	1.62x1.62	236mv with 1/30s 0.1mv with 1/30s	4@3840x2160 16@1920x1080	1x1 2x2	0.244ms~15s
ECMOS06600KPA EP606600A(New)	6.6M/IMX326(C) 1/2.9"(4.98x3.50)	1.62x1.62	236mv with 1/30s 0.1mv with 1/30s	5@3072x2160 6@2592x1944 6@3072x1728 7@2160x2160	1x1 1x1 1x1 1x1	0.244ms~15s
ECMOS05300KPA EP605300A	5.3M/IMX178(C) 1/1.9" (7.37x4.15)	2.4x2.4	425mv with 1/30s 0.15mv with 1/30s	5.5@3072 x1728 35@1280x720	1x1 2x2	0.105ms~15s
ECMOS05000KPA EP605000A	5.0M/IMX335(C) 1/2.8" (5.18x3.89)	2.0x2.0	505mv with 1/30s 0.13mv with 1/30s	6.4@2592 x1944 26.7@1296x972	1x1 2x2	0.1ms~15s
ECMOS03100KPA EP603100A	3.1M/IMX123(C) 1/2.8" (5.12x3.84)	2.5x2.5	600mv with 1/30s 0.15mv with 1/30s	11.5@2048x1536 18.3@1920x1080 18.1@1600x1200 29.5@1024x768	1x1 1x1 1x1 2x2	0.105ms~15s
ECMOS02000KPA EP602000A	2.0M/IMX290(C) 1/2.8"(5.56x3.13)	2.9 x2.9	1300mv with 1/30s 0.15mv with 1/30s	17@1920x1080	1x1	0.105ms~15s
ECMOS01200KPA EP601200A	1.2M/IMX224(C) 1/3"(4.80x3.60)	3.75 x3.75	2040mv with 1/30s 0.15mv with 1/30s	27@1280x960 54@640x480	1x1 2x2	0.105ms~15s

C: Color; M: Monochrome;

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine/NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
ADC	8 Bit
Recording System	Still Picture and Movie
Cooling System*	Natural
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory: 2GB or More
	USB Port: USB2.0 Port
	Display: 17" or Larger
	CD-ROM

10.1.3 Dimension of ECMOS Series

The ECMOS series body, made from tough, CNC aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



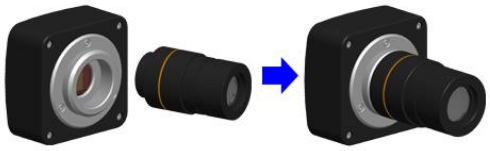
Dimension of ECMOS Series

10.1.4 Packing Information for ECMOS Series

Packing Information of ECMOS Series

Standard Camera Packing List			
A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo		
B	Gift box L:15cm W:15cm H:10cm (0.5~0.55Kg/ box)		
C	One ECMOS series camera		
D	High-speed USB2.0 A male to B male gold-plated connectors cable /2.0m		
E	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
F	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075
G	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075
		C-Mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075
Note: For F and G optional items, please specify your camera type(C-mount, microscope camera or telescope camera) , ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
H	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
I	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
J	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube		
K	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

10.1.5 Extension of ECMOS Series with Microscope or Telescope Adapter

Extension	Picture	
C-mount Camera		Machine vision; Medical imaging; Semiconductor equipment; Test instruments; Document scanners; 2D barcode readers; Web camera and security video; Microscope imaging;
Microscope Camera	 ECMOS+AMAXXX(23.2mm Adapter)	 ECMOS+FMAXXX(23.2mm Adapter)
Telescope Camera	 ECMOS+ATAXXX(31.75mm Adapter)	 ECMOS+FTAXXX(31.75mm Adapter)

10.2 LCMOS Series C-mount USB2.0 CMOS Camera (9)

10.2.1 The Basic Characteristic of LCMOS Series

LCMOS series is Luxurious USB2.0 CMOS camera with frame buffers and it adopts ultra-high performance CMOS sensor as the image-picking device, and USB2.0 is used as the data transfer interface.

LCMOS series comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/Linux/OSX multiple platform SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

The LCMOS series can be widely used in bright field environment and microscope image capture and analysis with moderate speed.

The basic characteristic of LCMOS series cameras are as follows:

- Stand C-Mount camera with Aptina CMOS sensor;
- With hardware resolution among 1.2M to 14M;
- On-board memory for perfect synchronization，higher frame rate and stable performance;
- High performance cooling structure, ensures low image noise;
- USB2.0 interface ensuring high speed data transmission;
- Ultra-Fine color engine with perfect color reproduction capability;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

10.2.2 LCMOS Series Datasheet (9)

Order Code	Sensor & Size(mm)	Pixel(μm)	G Responsivity Dynamic range SNRmax	FPS/Resolution	Binning	Exposure
LCMOS14000KPA LP614000A	14M/MT9F002(C) 1/2.3"(5.73x4.60)	1.4x1.4	0.724v/lux-sec 65.3dB 35.5dB	2.7@4096x3288 10@2048x1644 35@1024 x822	1x1 2x2 4x4	0.4ms~2000ms
LCMOS12000KPA LP612000A(2022)	12M/IMX577(C) 1/2.1" (5.95x4.71)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	3@3840x3040 11@1920x1516 47@960x758	1x1 2x2 4x4	0.4ms~2000ms
LCMOS10000KPA LP610000A(2022)	10M/IMX577(C) 1/2.3" (5.56x4.26)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	3.3@3584x2748 12@1792x1374 53@896x684	1x1 2x2 4x4	0.4ms~2000ms
LCMOS09000KPA LP609000A(2022)	9M/Special(C) 1/2.4"(5.41x4.05)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	3.5@3488x2616 13@1744x1308 55@872x654	1x1 2x2 4x4	0.4ms~2000ms
LCMOS08000KPA LP608000A(2022)	8M/Special(C) 1/2.5"(5.06x3.79)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	4@3264x2448 15@1600x1200 62@800x600	1x1 2x2 4x4	0.4ms~2000ms
LCMOS05100KPA LP605100A(2022)	5.1M/AR0521(C) 1/2.5" (5.70x4.28)	2.2x2.2	18.8ke-/lux 73dB 40dB	7.0@2592x1944 27.7@1296x972 100.5@648x486	1x1 2x2 4x4	0.2ms~2000ms
LCMOS03100KPB LP603100B(2022)	3.1M/IMX123(C) 1/2.8" (5.12x3.84)	2.5x2.5	600mv with 1/30s 0.15mv with 1/30s	11.5@2048x1536 29.5@1024x768	1x1 2x2	0.2ms~2000ms
LCMOS01300KPA LP601300A	1.3M/MT9M111(C) 1/3"(4.60x3.70)	3.6x3.6	2.1V/lux-sec 68.2dB 45dB	15@1280x1024 26@640x512 48@320x256	1x1 2x2 4x4	0.14ms~2000ms
LCMOS01200KPB LP601200B	1.2M/AR0130(C) 1/3"(4.80x3.60)	3.75 x3.75	5.5v/lux-sec 85.3dB 44dB	28@1280x960 30@640x480	1x1 2x2	0.4ms~2000ms
~~LCMOS09000KPB~~ ~~LP609000B~~	9M/Special(C) 1/2.4"(5.83x4.37)	1.67x1.67	0.31v/lux-sec 65.2dB 34dB	3.9@3488x2616 15@1744x1308 47@872 x654	1x1 2x2 4x4	0.4ms~2000ms
~~LCMOS08000KPB~~ ~~LP608000B~~	8M/Special(C) 1/2.5"(5.45x4.09)	1.67x1.67	0.31v/lux-sec 65.2dB 34dB	4.4@3264x2448 17@1600x1200 55@800x600	1x1 2x2 4x4	0.4ms~2000ms
~~LCMOS05100KPA~~ ~~LP605100A~~	5.1M/MT9P001(C) 1/2.5"(5.70x4.28)	2.2x2.2	0.53 V/lux-sec 66.5dB 40.5dB	6.8@2592x1944 18@1280x960 55@640x480	1x1 2x2 4x4	0.294ms~2000ms
~~LCMOS03100KPA~~ ~~LP603100A~~	3.1M/MT9T001(C) 1/2"(6.55x4.92)	3.2x3.2	1.0 V/lux-sec 61dB 43dB	11.5@2048x1536 32@1024x768 45@680x510	1x1 2x2 3x3	0.244ms~2000ms
~~LCMOS03100KPB~~ ~~LP603100B~~	3.1M/IMX036(C) 1/2.8"(5.12x3.84)	2.5x2.5	200mv with 1/30s 0.5mv with 1/30s	12@2048x1536 48@1024x768 48@680x510	1x1 2x2 3x3	0.244ms~2000ms
~~LCMOS02000KPB~~ ~~LP602000B~~	2.0M/Special(C) 1/2.6"(5.12x3.84)	3.2x3.2	1.0 V/lux-sec 61dB 43dB	16@1600x1200 40@800x600	1x1 2x2	0.244ms~2000ms

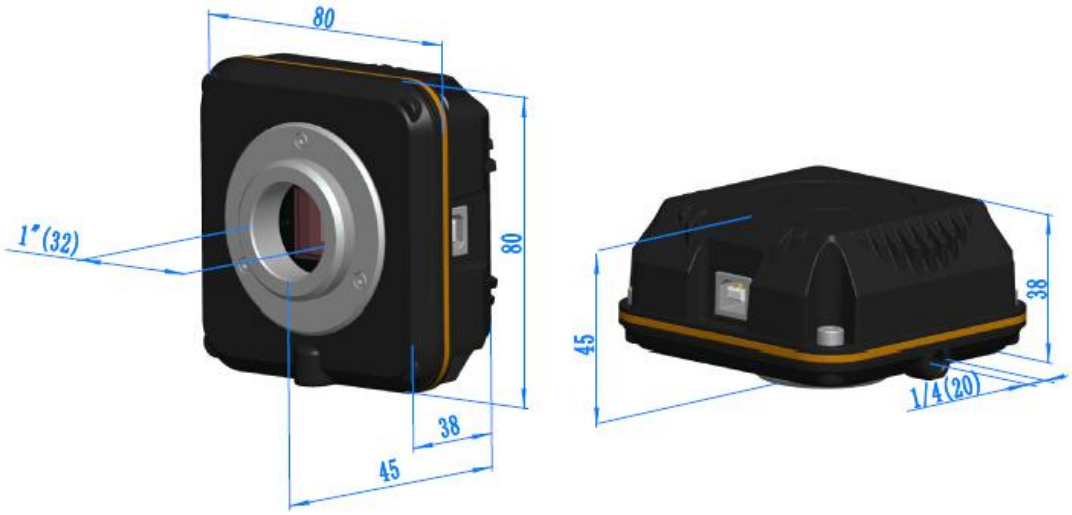
C: Color; M: Monochrome;

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine/NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
ADC	8 Bit
Recording System	Still Picture and Movie
Cooling System*	Natural with High Performance Cooling Structure
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit)，OSx(Mac OS X),Linux

PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB2.0 High-speed Port
	Display:17” or Larger
	CD-ROM

10.2.3 Dimension of LCMOS Series

The LCMOS series body, made from tough, aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



Dimension of LCMOS Series

10.2.4 Packing Information of LCMOS Series

Packing Information of LCMOS Series

Standard Camera Packing List			
A	Carton L:40cm W:36cm H:36cm (16pcs, 12~17Kg/ carton), not shown in the photo		
B	Gift box L:16.4cm W:16.4cm H:9.6cm (0.7~0.8Kg/ box)		
C	One LCMOS series camera		
D	High-speed USB2.0 A male to B male gold-plated connectors cable /2.0m		
E	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
F	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075
G	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075
Note: For F and G optional items, please specify your camera type(C-mount, microscope camera or telescope camera) , ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
H	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
I	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
J	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube		
K	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

10.2.5 Extension of LCMOS Series with Microscope or Telescope Adapter

Extension	Picture	
C-mount Camera		Machine vision; Medical imaging; Semiconductor equipment; Test instruments; Document scanners; 2D barcode readers; Web camera and security video; Microscope imaging;
Microscope Camera	 LCMOS+AMAXXX(23.2mm Adapter)	 LCMOS+FMAXXX(23.2mm Adapter)
Telescope Camera	 LCMOS+ATAXXX(31.75mm Adapter)	 LCMOS+FTAXXX(31.75mm Adapter)

10.3 UCMOS Series C-mount USB2.0 CMOS Camera (10)

10.3.1 The Basic Characteristic of UCMOS Series

UCMOS series is an ultra-high performance CMOS camera and it adopts ultra-high performance CMOS sensor as the image-picking device. USB2.0 is used as the data transfer interface.

UCMOS series hardware resolutions ranges from 0.35M to 14M and comes with the CNC aluminum alloy compact housing. UCMOS series comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/Linux/OSX multiple platform SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API; The UCMOS can be widely used in bright field light environment and microscope image capture and analysis with moderate frame rate.

The basic characteristic of UCMOS series cameras are as follows:

- Standard C-Mount with Aptina CMOS sensor;
- CNC aluminum alloy housing;
- USB2.0 interface ensuring high speed data transmission;
- Ultra-Fine color engine with perfect color reproduction capability;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

10.3.2 UCMOS Series Datasheet(10)

Order Code	Sensor & Size(mm)	Pixel(μm)	G Responsivity Dynamic range SNRmax	FPS/Resolution	Binning	Exposure
UCMOS14000KPA TP614000A	14M/MT9F002(C) 1/2.3"(5.73x4.60)	1.4x1.4	0.724v/lux-sec 65.3dB 35.5dB	1.8@4096x3288 10@2048x1644 27@1024x822	1x1 2x2 4x4	0.4ms~2000ms
UCMOS12000KPA TP612000A(2022)	12M/IMX577(C) 1/2.1" (5.95x4.71)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	3@3840x3040 11@1920x1516 47@960x758	1x1 2x2 4x4	0.4ms~2000ms
UCMOS10000KPA TP610000A(2022)	10M/IMX577(C) 1/2.3" (5.56x4.26)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	3.3@3584x2748 12@1792x1374 53@896x684	1x1 2x2 4x4	0.4ms~2000ms
UCMOS09000KPB TP609000B(2022)	9M/Special(C) 1/2.4"(5.41x4.05)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	3.5@3488x2616 13@1744x1308 55@872x654	1x1 2x2 4x4	0.4ms~2000ms
UCMOS08000KPB TP608000B(2022)	8M/Special(C) 1/2.5"(5.06x3.79)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	4@3264x2448 15@1600x1200 62@800x600	1x1 2x2 4x4	0.4ms~2000ms
UCMOS05100KPA TP605100A(2022)	5.1M/AR0521(C) 1/2.5" (5.70x4.28)	2.2x2.2	18.8ke-/lux 73dB 40dB	7.0@2592x1944 27.7@1296x972 100.5@648x486	1x1 2x2 4x4	0.2ms~2000ms
UCMOS04100KPA TP604100A(2023)	4.1M/IMX347(C) 1/1.8" (7.795x4.408)	2.9x2.9	2376mv with 1/30s 0.15mv with 1/30s	8.5@2688x1536 11.5@2048x1536 15@1536x1536 34@1344x768	1x1 1x1 1x1 1x1	0.1ms~2000ms
UCMOS04100KPB TP604100B(20230725)	4.1M/IMX664(C) 1/1.8" (7.795x4.408)	2.9x2.9	5970mv with HCG mode 0.13mv with 1/30s	8.5@2688x1520 34@1344x760	1x1 2x2	0.1ms~2000ms
UCMOS03100KPB TP603100B(2022)	3.1M/IMX123(C) 1/2.8" (5.12x3.84)	2.5x2.5	600mv with 1/30s 0.15mv with 1/30s	11.5@2048x1536 29.5@1024x768	1x1 2x2	0.2ms~2000ms
UCMOS01300KPA TP601300A	1.23M/SC1235(C) 1/3" (4.80x3.60)	3.75x3.75	4.5V/lux-sec 74dB 38dB	15@1280x960 15@1280x720	1x1 1x1	0.14ms~2000ms
~~UCMOS10000KPA~~ ~~TP610000A~~	10M/MT9J003(C) 1/2.3" (5.98x4.59)	1.67x1.67	0.31v/lux-sec 65.2dB 34dB	1.9@3584x2748 8@1792x1374 27@896x684	1x1 2x2 4x4	0.4ms~2000ms
~~UCMOS09000KPB~~ ~~TP609000B~~	9M/Special(C) 1/2.4"(5.83x4.37)	1.67x1.67	0.31v/lux-sec 65.2dB 34dB	1.9@3488x2616 8@1744x1308 27@872x654	1x1 2x2 4x4	0.4ms~2000ms
~~UCMOS08000KPB~~ ~~TP608000B~~	8M/Special(C) 1/2.5"(5.45x4.09)	1.67x1.67	0.31v/lux-sec 65.2dB 34dB	1.9@3264x2448 8@1600x1200 27@800x600	1x1 2x2 4x4	0.4ms~2000ms
~~UCMOS05100KPA~~ ~~TP605100A~~	5.1M/MT9P006(C) 1/2.5" (5.70x4.28)	2.2x2.2	0.53 V/lux-sec 66.5dB 40.5dB	5@2592x1944 18@1280x960 60@640x480	1x1 2x2 4x4	0.294ms~2000ms
~~UCMOS03100KPA~~ ~~TP603100A~~	3.1M/MT9T001(C) 1/2" (6.55x4.92)	3.2x3.2	1.0 V/lux-sec 61dB 43dB	8@2048x1536 22@1024x768 43@680x510	1x1 2x2 3x3	0.244ms~2000ms
~~UCMOS02000KPB~~ ~~TP602000B~~	2.0M/Special(C) 1/2.6"(5.12x3.84)	3.2x3.2	1.0 V/lux-sec 61dB 43dB	16@1600x1200 50@800x600	1x1 2x2	0.128ms~2000ms
~~UCMOS01300KMA~~ ~~TM601300A~~	1.3M/MT9M001(M) 1/2" (6.66x5.32)	5.2x5.2	2.1 V/lux-sec 68.2dB 45dB	20@1280x1024	1x1	0.14ms~500ms
~~UCMOS00350KPA~~ ~~TP600350A~~	0.35M/MT9V011(C) 1/4" (3.58x2.69)	5.6x5.6	1.9V/lux-sec 60dB 45dB	30@640x480 80@320x240	1x1 2x2	0.111ms~192ms

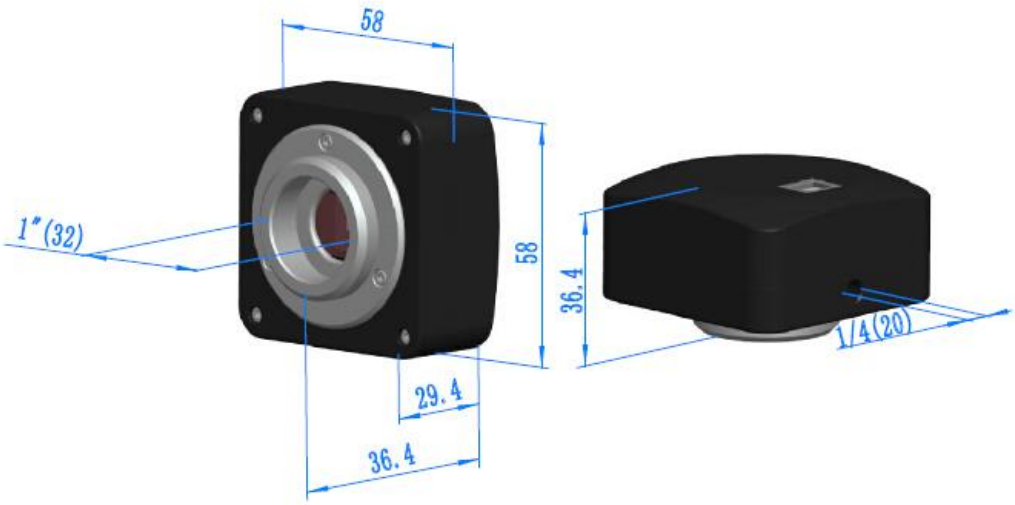
C: Color; M: Monochrome;

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine/NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
ADC	8 Bit
Recording System	Still Picture and Movie
Cooling System*	Natural
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in	-20~ 60

Centidegree)	
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB2.0 High-speed Port
	Display:17” or Larger
	CD-ROM

10.3.3 Dimension of UCMOS Series

The UCMOS series body, made from tough, aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



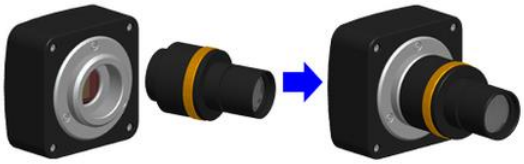
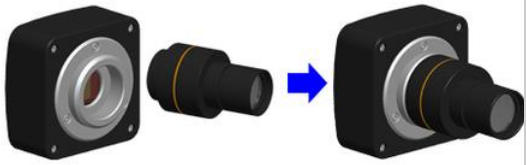
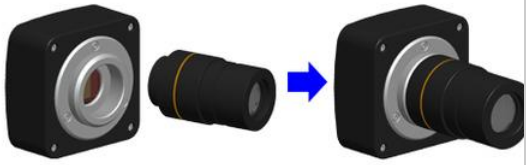
Dimension of UCMOS Series

10.3.4 Packing Information for UCMOS Series

Packing Information of UCMOS

Standard Camera Packing List			
A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo		
B	Gift box L:15cm W:15cm H:10cm (0.5~0.55Kg/ box)		
C	One UCMOS series camera		
D	High-speed USB2.0 A male to B male gold-plated connectors cable /2.0m		
E	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
F	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075
G	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075
Note: For F and G optional items, please specify your camera type(C-mount, microscope camera or telescope camera) , ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
H	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
I	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
J	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube		
K	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

10.3.5 Extension of UCMOS Series with Microscope or Telescope Adapter

Extension	Picture	
C-mount Camera		Machine vision; Medical imaging; Semiconductor equipment; Test instruments; Document scanners; 2D barcode readers; Web camera and security video; Microscope imaging;
Microscope Camera	 UCMOS+AMAXXX(23.2mm Adapter)	 UCMOS+FMAXXX(23.2mm Adapter)
Telescope Camera:	 UCMOS+ATAXXX(31.75mm Adapter)	 UCMOS+FTAXXX(31.75mm Adapter)

10.4 UA Series C-mount USB2.0 CMOS Camera(10)

10.4.1 The Basic Characteristic of UA Series

UA series is an Advanced USB2.0 CMOS camera. It adopts ultra-high performance CMOS sensor as the image-picking up device. USB2.0 is used as the data transfer interface.

UA series hardware resolutions ranges from 1.3M to 16M installed in the aluminum alloy CNC compact housing. UA comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/Linux/OSX multiple platform SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API; The UA can be widely used in bright field light environment and microscope image capture and analysis with moderate frame rate.

The basic characteristic of UA series cameras are as follows:

- Standard C-Mount with Aptina/Panasonic CMOS sensor;
- USB2.0 interface ensuring high speed data transmission;
- Ultra-Fine color engine with perfect color reproduction capability;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain Control API;
- External dedicated on-board buffer to achieve maximum performance of USB2.0
- Compatible with most of the old and new CPU PC;
- Aluminum alloy CNC housing which is the same as that of UCMOS series.

10.4.2 UA Series Datasheet(10)

Order Code	Sensor & Size(mm)	Pixel(μm)	G Responsivity Dynamic range SNRmax	FPS/Resolution	Binning	Exposure
UA1600CA UP901600A	16M/MN34120(C) 1/2.33"(6.18x4.66)	1.335x1.335	R: 2453LSB Gr: 2444LSB Gb: 1054LSB B: 996LSB	2@4632x3488 8@2320x1740 11@1536x1160	1x1 2x2 3x3	0.2ms~2000ms
UA1200CA UP901200A(2022)	12M/IMX577(C) 1/2.1" (5.95x4.71)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	3@3840x3040 11@1920x1516 47@960x758	1x1 2x2 4x4	0.4ms~2000ms
UA1000CA UP901000A(2022)	10M/IMX577(C) 1/2.3" (5.56x4.26)	1.55x1.55	250mv with 1/30s 0.25mv with 1/30s	3.3@3584x2748 12@1792x1374 53@896x684	1x1 2x2 4x4	0.4ms~2000ms
UA630CA UP900630A(2023)	6.3M/IMX178(C) 1/1.8" (7.37x4.92)	2.4x2.4	425mv with 1/30s 0.15mv with 1/30s	5fps@3072×2048 20fps@1536×1024	1x1 2x2	0.244ms~15000ms
UA630MA UM900630A(2023)	6.3M/IMX178(M) 1/1.8" (7.37x4.92)	2.4x2.4	760mv with 1/30s 0.15mv with 1/30s	5fps@3072×2048 20fps@1536×1024	1x1 2x2	0.244ms~15000ms
UA510CA UP900510A(2022)	5.1M/AR0521(C) 1/2.5" (5.70x4.28)	2.2x2.2	18.8ke-/lux 73dB 40dB	7.0@2592x1944 27.7@1296x972 100.5@648x486	1x1 2x2 4x4	0.2ms~2000ms
UA410CA UP900410A(2023)	4.1M/IMX347(C) 1/1.8" (7.795x4.408)	2.9x2.9	2376mv with 1/30s 0.15mv with 1/30s	8.5@2688x1536 11.5@2048x1536 15@1536x1536 34@1344x768	1x1 1x1 1x1 1x1	0.1ms~2000ms
UA410CB UP900410AB(20230725)	4.1M/IMX664(C) 1/1.8" (7.795x4.408)	2.9x2.9	5970mv with HCG mode 0.13mv with 1/30s	8.5@2688x1520 34@1344x760	1x1 2x2	0.1ms~2000ms
UA310CB UP900310B(2022)	3.1M/IMX123(C) 1/2.8" (5.12x3.84)	2.5x2.5	600mv with 1/30s 0.15mv with 1/30s	11.5@2048x1536 29.5@1024x768	1x1 2x2	0.2ms~2000ms
UA130CA UP900130A	1.23M/SC1235(C) 1/3" (4.80x3.60)	3.75x3.75	4.5V/lux-sec 74dB 38dB	25@1280x960 25@1280x720	1x1 1x1	0.1ms~2000ms
~~UA1000CA(New)~~ ~~UP901000A~~	10M/MT9J003(C) 1/2.3" (5.98x4.59)	1.67x1.67	0.31v/lux-sec 65.2dB 34dB	3.3@3584x2748 11@1792x1374 38@896x684	1x1 2x2 4x4	0.4ms~2000ms
~~UA510CA(New)~~ ~~UP900510A~~	5.1M/MT9P006(C) 1/2.5" (5.70x4.28)	2.2x2.2	0.53 V/lux-sec 66.5dB 40.5dB	7@2592x1944 27@1280x960 90@640x480	1x1 2x2 4x4	0.294ms~2000ms
~~UA310CA(New)~~ ~~UP900310A~~	3.1M/MT9T001(C) 1/2" (6.55x4.92)	3.2x3.2	1.0 V/lux-sec 61dB 43dB	12@2048x1536 32@1024x768 45@680x510	1x1 2x2 3x3	0.244ms~2000ms

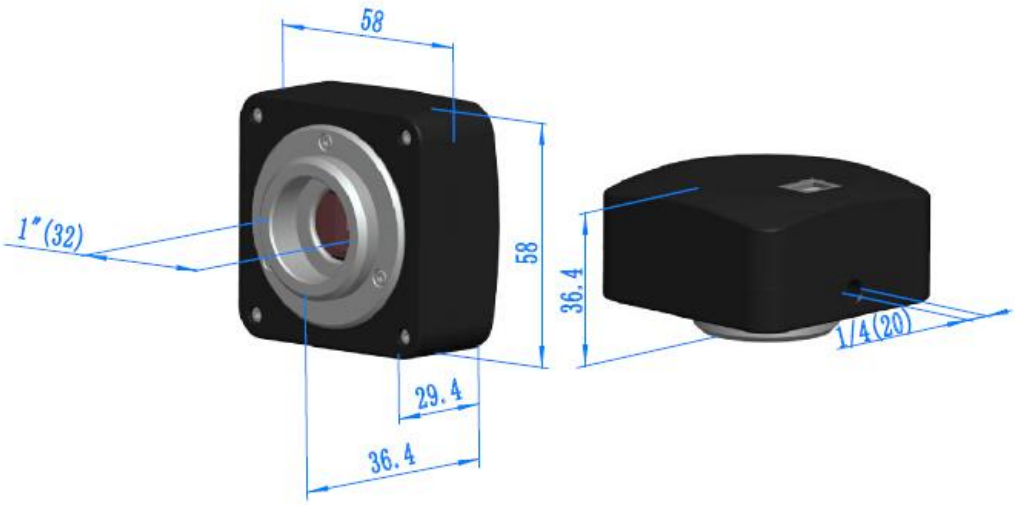
C: Color; M: Monochrome;

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine/NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
ADC	8 Bit
Recording System	Still Picture and Movie
Cooling System*	Natural
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB2.0 High-speed Port

	Display:17” or Larger
	CD-ROM

10.4.3 Dimension of UA Series

The UA series body, made from CNC tough, aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



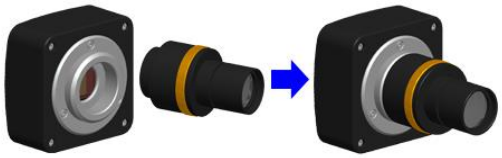
Dimension of UA Series

10.4.4 Packing Information for UA Series

Packing Information of UA Series

Standard Camera Packing List			
A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo		
B	Gift box L:15cm W:15cm H:10cm (0.5~0.55Kg/ box)		
C	One UA series camera		
D	High-speed USB2.0 A male to B male gold-plated connectors cable /2.0m		
E	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
F	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075
G	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075
Note: For F and G optional items, please specify your camera type(C-mount, microscope camera or telescope camera) , ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
H	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
I	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
J	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube		
K	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

10.4.5 Extension of UA Series with Microscope or Telescope Adapter

<table>
<tr><th>Extension</th><th colspan="2">Picture</th></tr>
<tr><td>C-mount Camera</td><td>  </td><td>Machine vision; Medical imaging;
Semiconductor equipment; Test instruments;
Document scanners; 2D barcode readers;
Web camera and security video;
Microscope imaging;</td></tr>
<tr><td>Microscope Camera</td><td colspan="2"> 
UA+AMAXXX(23.2mm Adapter)
 
UA+FMAXXX(23.2mm Adapter)</td></tr>
<tr><td>Telescope Camera:</td><td colspan="2"> 
UA+ATAXXX(31.75mm Adapter)
 
UA+FTAXXX(31.75mm Adapter)</td></tr>
</table>

10.5 C2CMOS Series C-mount USB2.0 CMOS Camera (6)

10.5.1 The Basic Characteristic of C2CMOS Series

- Standard C-Mount camera with Sony or OnSemi CMOS sensor;
- USB2.0 interface ensuring high speed data transmission;
- Integrated with large capacity memory chip ensures data synchronous transmission, low latency, high frame rate and stability;
- Compatible with Microsoft USB Video Class protocol and support the third-party software development;
- Built in Ultra-fine hardware ISP engine ensures high color restoration;
- Support automatic/manual exposure switching, accurate exposure time control, and real-time adjustment of exposure target area;
- Support automatic/manual/ROI white balance;
- Support color adjustment/color mode selection/image flipping;
- Support histogram adjust/flat field correction/dark field correction/video ROI;
- High performance MJPEG compression algorithm, combined with the unique decoding method of ToupView and image restoration algorithm ensure highest frame rate of USB2.0 camera in the industry. The FPS for 5MP and 8MP can be up to 30FPS; the FPS for 12MP can be up to 15FPS;
- Comply with CE and FCC agreements;
- CNC aluminum alloy housing;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Very competitive pricing.

10.5.2 C2CMOS Series Datasheet(6)

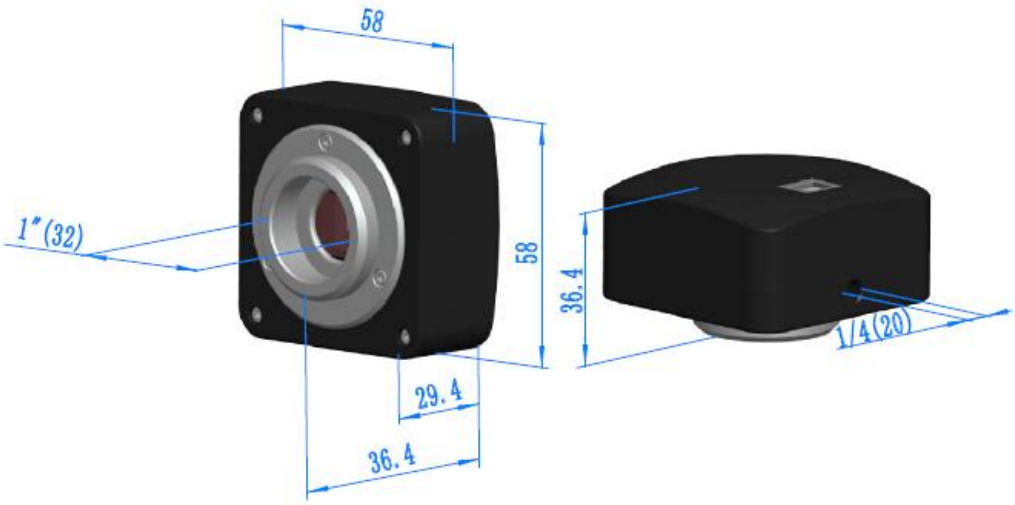
Order Code	Sensor & Size(mm)	Pixel(μm)	G Responsivity Dynamic range SNRmax	FPS/Resolution	Binning	Exposure
C2CMOS12000KPA CP212000A(2020)	12M/IMX577(C) 1/2.3“ (5.95x4.71)	1.55x1.55	250LSB 70dB 43dB	20@3840x3040 20@1920x1520 20@960x760	1x1 1x1 1x1	0.1-2000 ms
C2CMOS08300KPA CP208300A	8.3M/IMX274(C) 1/2.5“ (6.22x3.50)	1.62x1.62	236mV 70dB 43dB	30@3840x2160 30@1920x1080 30@1280x720 30@960x540	1x1 1x1 1x1	0.1-2000 ms
C2CMOS05100KPA CP205100A	5.1M/AR0521(C) 1/2.5“ (5.70x4.28)	2.2x2.2	18.8ke-/lus 73dB 40dB	30@2592x1944 30@1280x960 30@640x480	1x1 1x1 1x1	0.1-1000 ms
C2CMOS05100KPB CP205100B	5.1M/IMX335(C) 1/2.8“ (5.18x3.89)	2.0x2.0	505mV 70dB 43dB	26@2592x1944 26@1280x960 26@640x480	1x1 1x1 1x1	0.1-2000 ms
C2CMOS03100KPA CP203100A	3.1M/Aptina(C) 1/2.5“ (5.73x4.3)	2.8x2.8	18.8ke-/lus 73dB 40dB	30@2048x1536 30@1024x768	1x1 1x1	0.1-1000 ms
C2CMOS02100KPA CP202100A	2.1M/IMX307(C) 1/2.8“ (5.73x4.3)	2.9x2.9	1300mV 73dB 43dB	38@1920x1080 38@1024x768	1x1 1x1	0.1-2000 ms

C: Color; M: Monochrome;

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	Auto/Manual/ROI White Balance/Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-fine hardware ISP engine /NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
Data Interface	USB2.0
Data Format	MJPEG
Recording System	Still Picture and Movie
Cooling System*	Natural
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB2.0 High-speed Port
	Display:17” or Larger
	CD-ROM

10.5.3 Dimension of C2CMOS Series

The C2CMOS series body, made from tough, aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



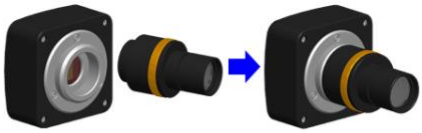
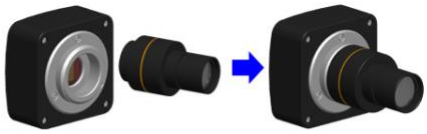
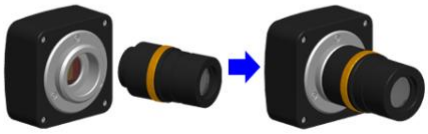
Dimension of C2CMOS Series

10.5.4 Packing Information for C2CMOS Series

Packing Information of C2CMOS Series

Standard Camera Packing List			
A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo		
B	Gift box L:15cm W:15cm H:10cm (0.5~0.55Kg/ box)		
C	One C2CMOS series camera		
D	High-speed USB2.0 A male to B male gold-plated connectors cable /2.0m		
E	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
F	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075
G	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075
Note: For F and G optional items, please specify your camera type(C-mount, microscope camera or telescope camera) , ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
H	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
I	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
J	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube		
K	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

10.5.5 Extension of C2CMOS Series with Microscope or Telescope Adapter

Extension	Picture	
C-mount Camera		Machine vision; Medical imaging; Semiconductor equipment; Test instruments; Document scanners; 2D barcode readers; Web camera and security video; Microscope imaging;
Microscope Camera	 C2CMOS+AMAXXX(23.2mm Adapter)  C2CMOS+FMAXXX(23.2mm Adapter)	
Telescope Camera:	 C2CMOS+ATAXXX(31.75mm Adapter)  C2CMOS+FTAXXX(31.75mm Adapter)	

10.6 SPCMOS Series USB2.0 CMOS Eyepiece Camera with Reduction Lens(6)

10.6.1 The Basic Characteristic of SPCMOS Series

ToupTek SPCMOS series is an extension of ToupTek's SCMOS camera with fixed reduction lens to increase the field of view from the microscope eyepiece tube. The SPCMOS series is still an economic version with simple and compact structure CMOS eyepiece camera. So here, the S means simple and compact, P means plus. USB2.0 is used as the data transfer interface.

The SPCMOS series comes with high-speed USB2.0 interface and high frame rate video display keep the screen smooth without interruption;

Also the SPCMOS series comes with advanced video & image processing application ToupView/ToupLite;

The SPCMOS series can be widely used to transfer the mono or binocular student microscopes to digital microscope.

With 23.2 to 30mm or 23.2 to 30.75 convert ring, the SPCMOS series can also change the stereo microscope to digital stereo microscope.

The basic characteristic of SPCMOS series cameras are as follows:

- Microscope eyepiece camera with 23.2 diameter and compact size;
- An extension of ToupTek's SCMOS camera with fixed reduction lens to ensure the full field of view of the microscope from the eyepiece can be imaged to the CMOS sensor;
- High-quality camera with Aptina CMOS sensor;
- Auto white balance and auto-exposure; Brightness, contrast, chroma, and saturation can be adjusted;
- High-speed USB2.0 interface and high frame rate video display keep the screen smooth without interruption;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

SPCMOS Series Eyepiece

10.6.2 SPCMOS Series Datasheet(6)

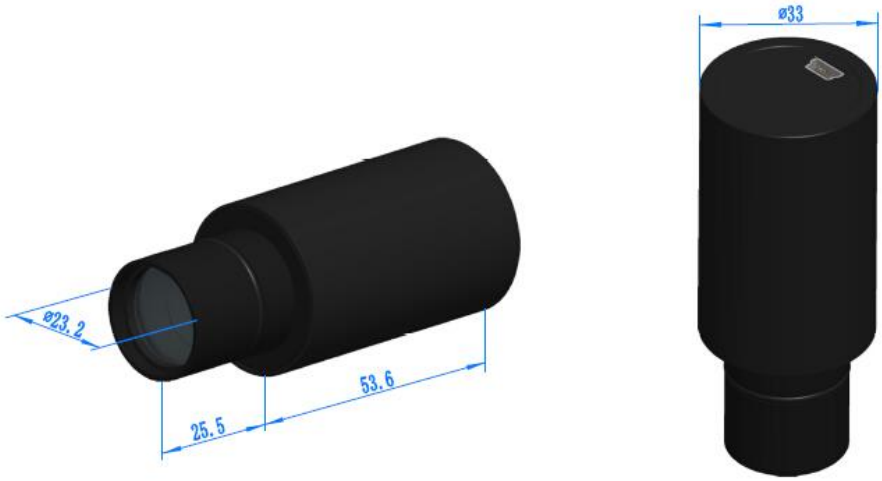
Order Code	Sensor & Size(mm)	Pixel(μm)	G Responsivity Dynamic range SNRmax	FPS/Resolution	Binning	Exposure
SPCMOS05000KPA SP505000A	5.0M/Aptina(C) 1/2.5“ (5.70x4.28)	2.2x2.2	NA	2@2592x1944 3@2048x1536 5@1600x1200 7.5@1280x1024	N/A	Auto
SPCMOS03000KPA SP503000A	3.0M/Aptina(C) 1/2.7“ (4.51x3.38)	2.2x2.2	NA	3@2048x1536 5@1600x1200 7.5@1280x1024	N/A	Auto
SPCMOS02000KPA SP502000A	2.0M/Aptina(C) 1/3.2“ (4.48x3.36)	2.8x2.8	NA	5@1600x1200 7.5@1280x1024 7.5@1280x960 20@800x600	N/A	Auto
SPCMOS01300KPA SP501300A	1.3M/Aptina(C) 1/3“ (4.60x3.70)	3.6x3.6	NA	7.5@1280x1024 12.5@1024x768 12.5@800x600	N/A	Auto
SPCMOS00350KPA SP500350A	0.35M/Aptina(C) 1/4“ (3.58x2.69)	5.6x5.6	NA	30@640x480	N/A	Auto
SPCMOS05100KPB SP505100B	5.1M/IMX335(C) 1/2.8“ (5.18x3.89)	2.0x2.0	505mV 70dB 43dB	26@2592x1944 26@1280x960 26@640x480	1x1 1x1 1x1	0.1-2000 ms

C: Color; M: Monochrome;

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	Auto White Balance
Color Technique	N/A
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
Recording System	Still Picture and Movie
Data Format	MJPEG
Cooling System*	Natural
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB2.0 High-speed Port
	Display:17” or Larger
	CD-ROM

10.6.3 Dimension of SPCMOS Series

The SPCMOS series body, made from aluminum alloy blackening, ocular housing: Dia.33 X 79.1mm ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT filter to filter the infrared light and protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



Dimension of SPCMOS Series

10.6.4 Packing Information for SPCMOS Series

Packing Information of SPCMOS Series

Standard Camera Packing List		
A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo	
B	Gift box L:15cm W:15cm H:10cm (0.25~0.26Kg/ box)	
C	One SPCMOS series eyepiece camera	
D	High-Speed USB2.0 A male to mini B 5-pin male gold-plated connectors cable /1.5m	
E	CD (Driver & utilities software, Ø8cm)	
Optional Accessory		
F	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube	
G	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube	
H	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube	
I	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)

10.7 SCMOS Series USB2.0 CMOS Eyepiece Camera (19)

10.7.1 The Basic Characteristic of SCMOS Series

ToupTek SCMOS series is an economic version with simple and compact structure CMOS eyepiece camera. So here, the S means simple and compact. USB2.0 is used as the data transfer interface.

The SCMOS series comes with high-speed USB2.0 interface and high frame rate video display keep the screen smooth without interruption;

Also the SCMOS series comes with advanced video & image processing application ToupView/ToupLite;

The SCMOS series can be widely used to transfer the mono or binocular student microscopes to digital microscope.

With 23.2 to 30mm or 23.2 to 30.75 convert ring, the SCMOS series camera can also change the stereo microscope to digital stereo microscope.

- Microscope eyepiece camera with 23.2 diameter and compact size;
- Easy to extend to C or CS- Mount camera with high quality lens(optional);
- High-quality camera with Aptina CMOS sensor;
- Auto white balance and auto-exposure; Brightness, contrast, chroma, and saturation can be adjusted;
- High-speed USB2.0 interface and high frame rate video display keep the screen smooth without interruption;
- With advanced video & image processing application ToupView/ToupLite;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

10.7.2 SCMOS Series Datasheet (19)

Order Code	Sensor & Size(mm)	Pixel(μm)	G Responsivity Dynamic range SNRmax	FPS/Resolution	Binning	Exposure
The New SCMOS after Jan. 2020 (10)						
SCMOS12000KPA TP512000A	12M/IMX577(C) 1/2.3“ (5.95x4.71)	1.55x1.55	250LSB 70dB 43dB	20@3840x3040 20@1920x1520 20@960x760	1x1 1x1 1x1	0.1-2000 ms
SCMOS00921KPA TP500921A **(New)**	0.92M/OV9732(C) 1/4“ (3.888x2.208)	3x3	2.066V/lux-sec 72dB@8x gain 39dB	30@1280x720 30@640x360	1x1 1x1	0.1ms~650ms
SCMOS08300KPA TP508300A	8.3M/IMX274(C) 1/2.5“ (6.22x3.50)	1.62x1.62	236mV 70dB 43dB	30@3840x2160 30@1920x1080 30@1280x720 30@960x540	1x1 1x1 1x1 1x1	0.1-2000 ms
SCMOS05100KPA TP505100A	5.1M/AR0521(C) 1/2.5“ (5.70x4.28)	2.2x2.2	18.8ke-/lus 73dB 40dB	30@2592x1944 30@1280x960 30@640x480	1x1 1x1 1x1	0.1-1000 ms
SCMOS05100KPB TP505100B	5.1M/IMX335(C) 1/2.8“ (5.18x3.89)	2.0x2.0	505mV 70dB 43dB	26@2592x1944 26@1280x960 26@640x480	1x1 1x1 1x1	0.1-2000 ms
SCMOS03100KPA TP503100A	3.1M/Aptina(C) 1/2.5“ (5.73x4.3)	2.8x2.8	18.8ke-/lus 73dB 40dB	30@2048x1536 30@1024x768	1x1 1x1	0.1-1000 ms
SCMOS02100KPA TP502100A	2.1M/IMX307(C) 1/2.8“ (5.73x4.3)	2.9x2.9	1300mV 73dB 43dB	38@1920x1080 38@960x540	1x1 1x1	0.1-2000 ms
SCMOS08300KPB TP508300B **(New)**	8.3M/IMX415(C) 1/2.8“ (5.57x3.13)	1.45x1.45	300mV 70dB 44dB	30@3840x2160 30@1920x1080 30@1280x720 30@960x540	1x1 1x1 1x1 1x1	0.1-2000 ms
SCMOS02100KPB TP502100B **(New)**	2.1M/SC2332 (C) 1/3“ (5.18x2.92)	2.7x2.7	4510mV/lux-s 74dB 38.5dB	30@1920x1080 30@960x540	1x1 1x1	0.1-2000 ms
SCMOS01301KPA TP501301A(**20220829**)	1.3M/Special (C) 1/3“ (5.18x2.92)	3.41x3.41	4510mV/lux-s 74dB 38.5dB	30@1520x856 30@760x428	1x1 1x1	0.1-2000 ms
The SCMOS before Dec. 2019 (9)						
SCMOS05000KPA TP505000A	5.0M/Aptina(C) 1/2.5“ (5.70x4.28)	2.2x2.2	NA	2@2592x1944 3@2048x1536 5@1600x1200 7.5@1280x1024	N/A	Auto
SCMOS05000KPB TP505000B(NEW)	5.0M/SC5033(C) 1/2.7“ (5.18x3.89)	2.0x2.0	2.0V/lux-sec 64dB 35dB	20@2592x1944 20@2048x1536 20@1600x1200 30@800x600	N/A	Auto
SCMOS03000KPA TP503000A	3.0M/Aptina(C) 1/2.7“ (4.51x3.38)	2.2x2.2	NA	3@2048x1536 5@1600x1200 7.5@1280x1024	N/A	Auto
SCMOS03000KPB TP503000B(NEW)	3.0M/SmartSens(C) 1/3“ (4.10x3.07)	2.0x2.0	2.0V/lux-sec 64dB 35dB	20@2048x1536 20@1600x1200 30@800x600	N/A	Auto
SCMOS02000KPA TP502000A	2.0M/Aptina(C) 1/3.2“ (4.48x3.36)	2.8x2.8	NA	5@1600x1200 7.5@1280x1024 20@800x600 22@640x480	N/A	Auto
SCMOS02000KPB TP502000B(NEW)	2.0M/OV2710(C) 1/2.7”(5.76x3.24)	3x3	3.3V/ Lux-sec 69dB 39dB	25@1920x1080 30@1280x1024 30@1280x720	N/A	Auto
SCMOS01300KPA TP501300A	1.3M/Aptina(C) 1/3“ (4.60x3.70)	3.6x3.6	NA	7.5@1280x1024 12.5@1024x768 12.5@800x600	N/A	Auto
SCMOS00920KPA TP500A(NEW)	0.92M/BG0703(C) 1/2.7” (5.80x3.28)	4.5x4.5	5.8V/ Lux-sec 65dB 43dB	25@1280x720 25@640x480	N/A	Auto
SCMOS00350KPA TP500350A	0.35M/Aptina(C) 1/4“ (3.58x2.69)	5.6x5.6	NA	30@640x480	N/A	Auto

SCMOS05000KPB and SCMOS03000KPB have fast speed than SCMOS05000KPA and SCMOS03000KPA

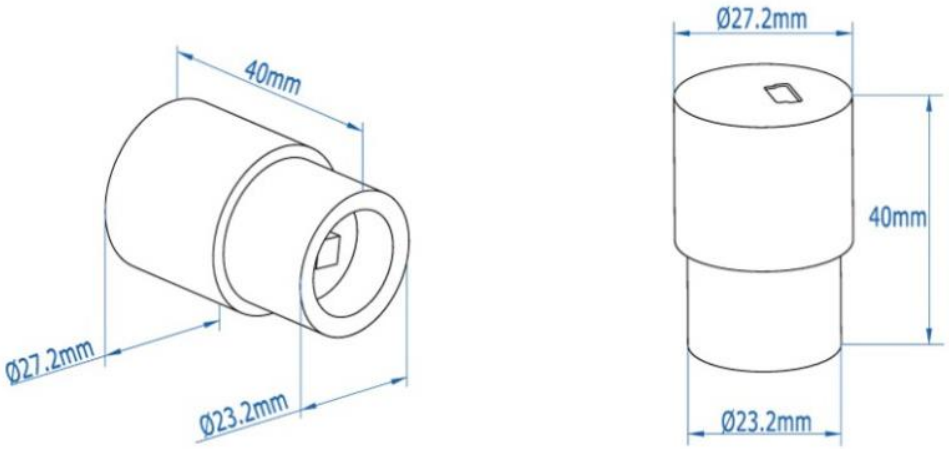
C: Color; M: Monochrome;

Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	Auto/ROI/Manual White Balance(New Model) Auto(Products before 2020)

Color Technique	N/A
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
Recording System	Still Picture and Movie
Data Format	MJPEG
Cooling System*	Natural
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB2.0 High-speed Port
	Display:17” or Larger
	CD-ROM

10.7.3 Dimension of SCMOS Series

The SCMOS series body, made from aluminum alloy blackening, ocular housing: Dia.27.2 X 40mm ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT filter to filter the infrared light and protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



Dimension of SCMOS Series

10.7.4 Packing Information for SCMOS Series

Packing Information of SCMOS Series

Standard Camera Packing List		
A	Carton L:52cm W:32cm H:33cm (50pcs, 12~17Kg/ carton), not shown in the photo	
B	Gift box L:14.5cm W:9.5cm H:6.0cm (0.15~0.16Kg/ box)	
C	One SCMOS series eyepiece camera	
D	High-Speed USB2.0 A male to mini B 5-pin male gold-plated connectors cable /1.5m	
E	CD (Driver & utilities software, Ø8cm)	
Optional Accessory		
F	C-Mount Adapter Housing:108027(HS502)	
G	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube	
H	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube	
I	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube	
J	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)

11 ToupView for ToupCam Cameras

ToupView is professional software integrated with camera control, image capture & process, image browse, image measurement and analysis. ToupView is born with the following features:

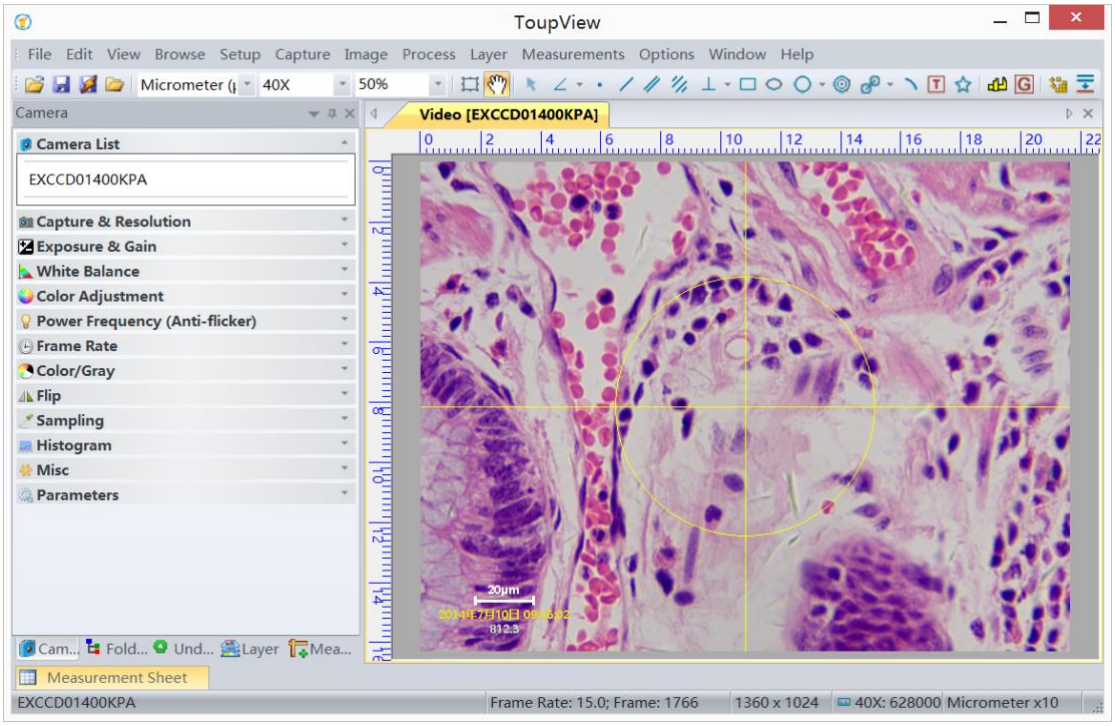
11.1 User-friendly UI design

Well-arranged menus and toolbars ensure quick operating;

The unique design of 5 sidebars -- Camera, Folders, Undo/Redo, Layer, Measurement are orderly classified；

Convenient operating method (Double click or right-click context menu) as much as possible;

Detailed help manual;



11.2 Professional Camera Control Panel

Exposure & Gain	Auto exposure (exposure target preset) and manual exposure (exposure time can be inputted manually); Up to 5 times gain;
White Balance	Advanced single-click intelligent white balance setting, temperature and tint can be manually adjusted;
Color Adjustment	Hue, saturation, brightness, contrast, gamma initialization adjustment;
Frame Rate Control	Adjustment of frame rate available for different computer configurations;
Power Frequency Setting(Anti-flicker)	Natural light/DC, AC 50 HZ, AC60 HZ switch function thoroughly eliminates video flicker;
Flip	Check the “horizontal” or “vertical” option to correct the sample direction;
Skip and bin sampling	Bin mode can obtain low noise video stream; Skip mode obtains sharper and smoother video stream. Support video stream histogram extension, Negative and positive switching, Gray calibration, Clarity factor for focusing etc.
Parameters	Load, save, overwrite, import, export self-defined parameters of camera control panel (including calibration information, exposure and color setting information);

11.3 Practical functions with good results

Video functions	Various professional functions: Video broadcast; Time lapse capture; Video record; Video watermark; Move watermark; Rotate watermark; Video stream grid; Video measurement; Video calibration, Gray calibration; Video EDF; Image stitch; Video scale bar, date and etc.;
Image Processing and Enhancement	Control and adjust image by contrast, denoise, all kinds of filtering algorithm and mathematical morphology algorithm; image rotate, image scale, image print;
2D Measurement	Easy video or image calibration. Various video and image measurement methods like area, perimeter, angle etc.. Measurement results can be hierarchical controlled according to characteristics or preferences;
Image Stitching	Image stitching can automatically combine a sequence of relevant images into a perfect larger one. No requirement on the image order； Support video window, image window, browse window image stitching operation.

EDF(Extended Depth of Focus)	Aimed at generating a clearer image by combining a sequence of previously captured multi-focus images; Support video window, image window, browse window EDF operation. Provided with maximum contrast, weighted average, FFDSSD algorithms to meet with most applications. Consider image shift, rotation and scale in the EDF process to guarantee EDF accuracy & speed;
Professional Segmentation & Count function	Integrate the advanced 6 image segmentation and particle counting algorithm (Watershed (W), OTSU Dark, OTSU Bright, RGB Histogram, HSV Histogram and Color Cube). Manual segmentation function (Split objects) ensures the success of a complete segmentation. The count result can be exported to Microsoft Excel for further analysis;
Image Stacking	Image stacking adopts advanced image matching technology. With the recorded video, regardless of shifting, rotation, scaling, the high fidelity image can be stacked to decrease the image noise.
Color Composite	Color composite adds appropriate pseudo color to monochrome fluorescence images. Fluorescence probe and color can be chosen from the pre-defined database. Dye database can also be easily created for special fluorescence probe.

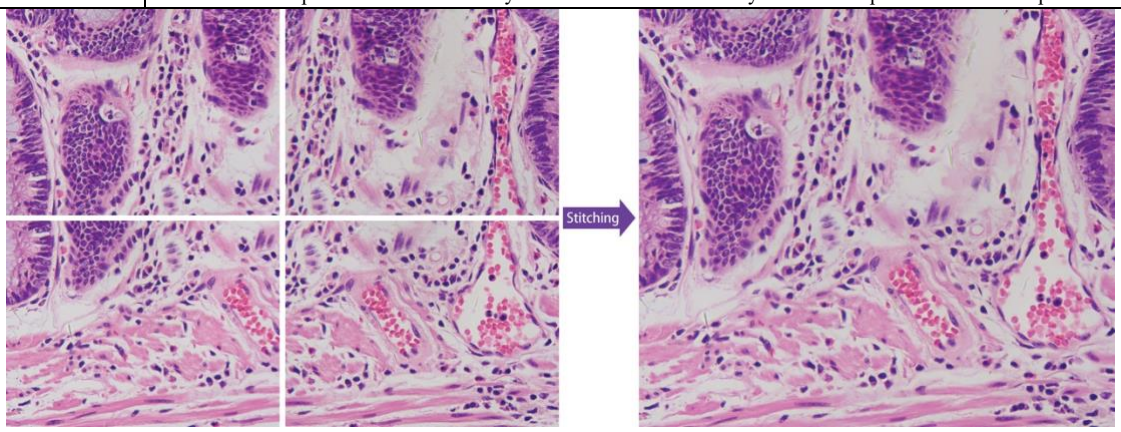


Image Stitching

EDF(Extended Depth of Focus)

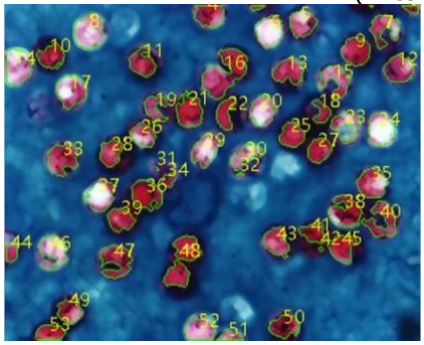


Image Segmentation & Count

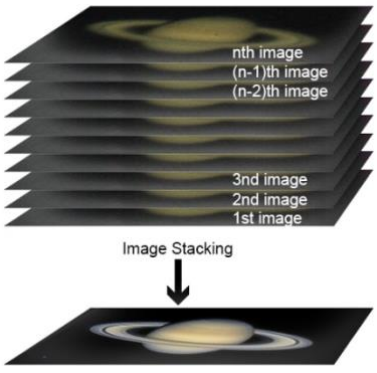
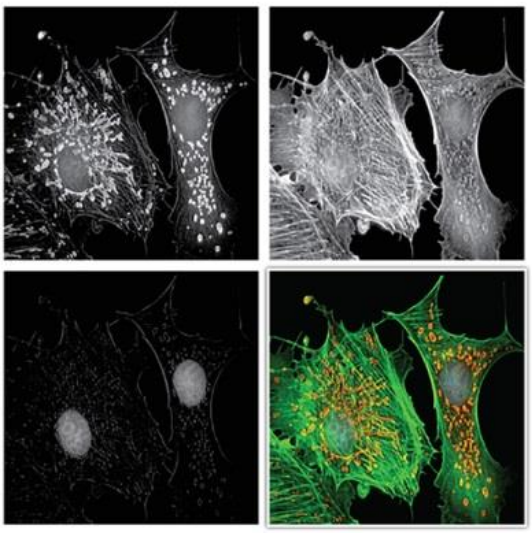


Image Stacking



Fluorescence Image Color Composite

11.4 Powerful compatibility

Video Interface	Support Twain, DirectShow, Labview, SDK Package（Native C++、C#）
Operating System	Compatible with Microsoft® Windows® XP / Vista / 7 / 8 /10 /11 (32 & 64 bit), Mac OSX, Linux
Language Support	Unlimited language support, currently available in English, Catalan, French, German, Indonesian, Italian, Japanese, Korean, Polish, Russian, Simplified Chinese, Spanish, Thai, Traditional Chinese, and Turkish

11.5 Hardware Requirement

PC Requirements	CPU: Intel Core 2 2.8GHz or Higher
	Memory:2GB or more
	USB port:USB2.0 or USB3.0 port
	Display:17” or Larger
	CD-ROM

12 ToupTek®-- Contact Information

	杭州图谱光电科技有限公司	
	杭州市西湖区西园五路 6 号奥强大厦 1 号楼 15 层	
	杭州, 310030, 浙江,	
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